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CCAB membership applied for in July 95

HP builds plant in Waterloo

HP Canada is building a 75,000 square foot facility in Waterloo, Ontario for its PANACOM Automation Division by Sept 1996. HP acquired the division in June, 1993 and is using the site for R&D and manufacturing. PANACOM makes network terminals or NeXTstations.

Globele distributes Microtest products

Founded in 1984, Microtest is a manufacturer of products for local area networks (LANs). With its cable management tools, network diagnostic equipment and network connectivity products, the company's mission is to make technology easy and productive for users. Microtest has pioneered LAN products such as PrintScanner, TruePort, Compas, Cable Scanner and Lanport.

The company is based in Phoenix, AZ.

Attech New Media adds Beamscope as distribution partner

Attech New Media, a CD-ROM publisher announced the addition of Beamscope Canada as a new distribution partner.

Beamscope is currently a leading distributor in Canada and is a going on with Attech will now make the products even more accessible on a nationwide basis.

Gain General building Pentium PCs in Canada

The desktop computers in Microsoft Windows running from 75 to 133MHz as well as the latest Intel TriCore chipset, 8MB RAM, 256KB cache, two 16550 high speed serial ports, EPP/ECF parallel port, four ISA and four PCI expansion slots, FLASH BIOS with plug and play support for Windows 95.

Customers can choose a one-year CPU speed, memory, storage and display options as well as networking and modems. The computers have a 3 year warranty. Prices start at \$2,200 and take 3-7 days to be built.

Computer Association raises money for Children's Aid Foundation

The Canada Chinese Computer Association raised about \$70,000 at their 2nd Annual Bowling Tournament and Gala Dinner in Markham, Ontario. The evening had a cocktail reception, dinner, live entertainment, a silent auction, and bowling awards presentation.

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The GA-586 AYS features an on board PCI VGA (SIS 6305) with Shared Memory Architecture, video performance up to 40 fps using MPEG software, an Intel 3.3V Pentium 75-100 Mhz microprocessor, 3 Master PCI slots, 3 ISA slots, a 586 SIOX and CMOS chipset, 256KB/1/2MB Write-Back Approach and cache and a Pipeline cache module on board.

Additional features include true plug and play (Winbond 82377), a maximum of 512MB DRAM, 2 channels enhanced IDE port on board, green function support and a flash AWARD BIOS.

For more information, call (800) 863-6922 or (800) 812-5019.



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Sceptre monitors are supported by the new PCI bus and VESA/LB cards and therefore able to operate at peak performance. The VGA card is able to simultaneously support both the LCD monitor and an external CRT monitor with a resolution of 1280 x 1024. Contrast ratio for the TFT is 150:1 and 20:1 for the dual scan. Brightness and contrast are digitally controlled. SRP starts at US\$1465. The panels are aimed at high end vertical markets.

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A Corporate Profile

Company Background

Sidus Systems Inc. was established in 1983. In less than a decade, Sidus has become the leading Canadian system manufacturer, systems integrator and distributor of high-end computers, periphery and network products, with global sales approaching \$200 million. The company is established in four main businesses: **Distribution** - the core business focusing on a broad range of complimentary products, such as monitors, harddisk drives, network peripherals; **Custom manufacturing of Sidus-branded products** for government and corporate end users; **Custom manufacturing of private label products** for original equipment manufacturers (OEM) and for other computer companies which includes system integration; **Multimedia** - providing a wealth of products which complements the other three areas of business. With a staff of over 200 people serving our customers from over 12 offices across Canada and the U.S., Sidus is also well established in the European arena.

Focusing on customer satisfaction and quality, the company has built a strong technical foundation combined with highly-trained systems integration professionals. Sidus has earned the internationally recognized ISO 9002 and Group 1 rating. This rating is a clear indication of the company's quality management system through all areas of operation.

Solution Portfolio

Sidus manufactures and distributes the full range of Intel-based personal computers and Sparc workstations for the general business market. The Sidus Sparc workstation serves lighter-end users that require intensive computing power and performance. A substantial commitment to R&D, combined with strategic OEM agreements with major component manufacturers, results in the production of the most advanced technology at competitive prices. Sidus also distributes other leading products from manufacturers such as Hewlett Packard, Xerox, Compaq and IBM in order to provide maximum flexibility.

Software requirements are satisfied through direct relationships with companies such as Microsoft, Novell, WordPerfect, Lotus, and Banyan. These relationships enable Sidus to implement solutions of all sizes, using the most current technologies with the highest level of support.

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Sidus' customer range from small networks to campus wide area network installations. Satisfying this diverse range of requirements has been possible by a large investment in technical resources. Certified Novell Engineers (CNEs), Certified Banyan Engineers (CBEs), Certified Network Instructors (CNI), and Certified Banyan Instructors (CBI) are available depending on the specific needs of the client. Continued training and upgrading of skills ensures that our professional support staff maintain their technological edge in the marketplace.

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Agfa Readies Digital Cameras

Taking aim at the digital camera market, Agfa has unveiled the StudioCam and ActionCam, a pair of high-end models designed for still and action photography.

The StudioCam captures still scenes at a resolution of 4,500 by 3,648 dots with 36-bit color for direct downloading through a Macintosh. The unit features a tubular CCD (charge-coupled device) sensor that's designed to provide fine detail in shadows and highlights.

The ActionCam is designed for coding, publishing, journalism, advertising, journalism, documentation and multimedia work. The unit is based on the Microle Macintosh, which has a 39-mm body. It can capture up to 24 images per minute at a resolution of 1,348 by 1,148 dots. The images can be sent to a computer via a modem, serial or direct SCSI link. Files are stored on removable miniature PCMCIA cards that plug into the back of the camera. Each card holds up to 114 images.

The StudioCam and ActionCam are available from Agfa at \$10,000 and \$12,000, respectively.

IBM, Apple, HP End Taligent Work

Taligent Inc. — a software joint venture by IBM, Apple Computer Inc. and Hewlett-Packard Co. — is being dissolved. More than half the staff is being laid off and Taligent's technology is being moved to IBM. SoftKey Says Computer's Learning

For \$106.5 million in stock, software distributor SoftKey International Inc. has agreed to buy Taligent Co.'s Computer & NewMedia Inc. and Computer's Learning Co. Under the deal, SoftKey will own a controlling interest in both.

Taiwan Firm to Sell Mac Clones

To become the first Taiwanese company to sell clones of the Apple Macintosh, Umea Data Systems Inc. has signed an agreement with Apple Computer Inc. to license the Mac operating system and PCs.

Umea plans to sell Apple clones from other manufacturers in the Asian market next year's third quarter, when it will start selling its own Apple clones worldwide.

Meanwhile, Lunar Ports, becoming more significant for Apple's next "Winning all of the

Taiwanese companies who were candidates for the license, Umea understands the Mac market the best and they already have sales and marketing resources for this market."

High-Speed Data Alliance Formed

AT&T Network Systems, Hewlett-Packard Co., Hyland Networks Inc. and Intel Corp. have agreed to develop interoperable protocols for delivering high-speed data services to PCs via broadband networks.

The companies plan to publish an open specification by the end of 1995, which they will then submit to the appropriate standards committees, cable companies and others for their review and recommendations.

Initially intended to be used for data, the protocol will eventually be capable of delivering voice and video services.

Broadband networks are capable of delivering data to PCs at speeds up to 1,000 times faster than 28.8 Kbps telephone modems. Besides taking full advantage of the multimedial offerings of the Internet, online services will offer data-megapictures.

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Digital back in the PC game

by Edward Trapani

Swallowing its pride, Digital Equipment of Canada, once a powerhouse on the Canadian technology scene, is re-entering the personal computer market with a vengeance. The subsidiary of Digital Equipment Corporation of Maynard, Mass., will produce two new lines of computers at its Kanata, Ontario plant especially designed to rival the popular Microsoft Windows 95 and Windows NT operating systems.

Pentium processors and the new Pentium Pro (PP) processor, which is standard in offices today, while the Alpha XL is based on Digital's 64-bit Alpha chip. Both are priced to compete in the desktop computer market with list prices starting at \$3,899.

Digital is identifying these new computers as personal workstations rather than personal computers.

With personal workstations Digital wants to fill the gap between the upper and lower PCs which just lacked the oomph that power users needed and the very expensive, but powerful, Sun and Silicon Graphics Unix based workstations.

"What you have to look at is the exploding growth of Windows 95 and Windows NT as an operating system for high end applications," says Steve Duncan, Digital Canada's manager of desktop products.

But George Bolat, manager of PC and related products for IDC Canada Limited, the research company that follows the information technology industries, says Digital isn't alone in its attempt to capture this middle ground.

"The threshold between the high end PC and the low end workstation is blurring," George Bolat says. "The power available with a Pentium and

in the new year with the Pentium Pro makes the argument for a personal workstation very compelling."

Digital expects to push production at the Kanata plant to the \$2 billion level, with \$1.5 billion of that in exports.

"We're now the largest PC manufacturer in Canada," says Steve Duncan. "Over 2,000 PCs are manufactured each day in the Canadian plant."

Early in the 1980s Digital stopped taking their PC division seriously by divesting them as a fail, and concentrating on the higher end minicomputer and workstation market. "That was a clear mistake," says Steve Duncan.

After a decade, in the summer of 1993, the once robust, then financially troubled, company re-entered the PC business with a

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value priced consumer product manufactured by other companies but carrying the Digital brand. Within two years, Digital became the world's seventh largest vendor of personal computers.

With this new personal workstation initiative Digital is shooting for number five in the personal computer business. This is more ambitious a jump than might be apparent since the leading five, IBM, Compaq, Apple, AST, and Dell, rank up the top tier and there is a perceptible drop to the second tier.

George Bates expects Digital to make its fifth place finish by the end of the year by attaining between 3 per cent and 4 per cent share of the single tier PC market. But to reach the top tier of vendors they have to breach the double digit market share.

"There is jostling among the second group who are between 3 and 4 per cent market share," he says. "NSC is just slightly ahead of Digital. To get up into the top five, they have their work cut out for them."

"Certainly name recognition seems to be our biggest problem right now," says Steve Duncan.

A persistent money loser, Digital has shown a significant turnaround over the last 18 months including four strong quarters in a row. The company attributes much of that growth to its personal computer business.

The new lines are directed specifically at larger businesses with software engineering, desktop publishing, architectural and design needs. □

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Sceptre's new monitor line

Sceptre's new WinPlay series of monitors met the VESA Display Data Channel (DDC) protocol requirements set forth in MS Windows 95. The plug and play WinPlay series has 14, 15, 17 and 21 inch DDC1 and DDC2B displays. They have VLMF and MPRI standards, on-screen display with digital controls. The 15" features 1024 x 768, 72Hz refresh rate and .28 dot pitch.

For more information, contact Sceptre at (800) 359-7658 or (905/477-6953 and (905) 244-7798 in Canada.



Fujitsu releases Windows 95 keyboard

The Fujitsu FK88735 is an 104-key membrane keyboard with 3 new keys for the Windows 95 OS. The new keys are located adjacent to the left and right of the spacebar. An application key, identified by a menu icon, functions like the right mouse button in apps that embrace use of a left and right Windows key, which have a Windows logo icon on them, activate the Windows 95 Task Manager user interface.

GB brings portable multimedia to notebook users

GB Micro is shipping the EXP CDS-940, a portable CD-ROM player with sound capability from EXP Computer Inc.

The CDS-940 consists of a 2x CD-ROM interface to a PCMCIA Type I card, providing a connection to any notebook with such a slot. The unit does not need an external power source. It also has SoundPort, a small sound module which connects to the PCMCIA interface card,

SoundNode has 16-bit stereo sound, built-in speakers, mic and volume control switch. Compliant with Windows Sound System, A4-05, Sound Blaster and Sound Blaster Pro. SRP \$500.



Keyboard with 3D Surround Sound

RMB Technologies Inc., the highest volume keyboard manufacturer in the world, joined with SRS () Labs, a leader in audio technology, to produce the Right Touch™ Concert Master™ multimedia keyboard.

SRS's technology, Sound Retrieval System, produces a three-dimensional sound image from any audio source with just two stereo speakers. The keyboard features SRS 3-D sound which creates a surround sound experience and brings all multimedia controls to the keyboard. This includes volume, mute, SRS on/off, and a built-in microphone.

The ConcertMaster keyboard features 3 side jacks for headphone, microphone and subwoofer; allows any audio device, such as external speakers, to plug into the keyboard; includes an integrated stacked speaker system with 3+2 watt amplifier; is compatible with all soundcards and portable audio devices; includes 3 new keys for Windows 95 mouse software. They are: application, left Windows, and right Windows. The application key brings up the context (pop-up) menu at the current select position. This is the equivalent of pressing the right mouse button in some applications today. Pressing the application key will not disturb the current mouse pointer position. The left Windows key sets focus to the Windows 95 user interface. The right Windows key has the same functionality as the left Windows key.

The keyboard incorporates a power slide switch which allows the user to turn on speakers or internal microphone without affecting the keyboard's functionality. It has a single cord exit for easy connection.

The SRS () differs from stereo and traditional sound expansion techniques because

it is based on the human hearing system. It retrieves the spatial information from recordings and restores the original three-dimensional sound field. As a result, the reproduced sound is much closer to a live performance.

ConcertMaster is 100 percent compatible with 386 or higher processor, Novell Netware, DOS, Windows 3.1 and Windows 95. RMB Technologies has received Microsoft Compatibility Labs' approval. ConcertMaster has been approved for logo usage by Creative Labs SoundBlaster compatibility. The Right Touch ConcertMaster keyboard is available for the 1993 holiday season through Ingram Micro and Altec Distributing, and retailers nationwide. The manufacturer's SRP is US\$199.95, street pricing could hover around US\$139.

For more information, contact RMB Precision Inc. at (905) 890-0370 or (800) 990-0889.



Dellco introduces 17" Monitor

Dellco Electronics has introduced a new 17" monitor. The CMC-1703B features, improved display and a newly designed bezel with extensive user controls.

The CMC-1703B is a 17" flat screen monitor featuring 0.28mm Dot Pitch and Invar Shadow Mask picture tube with viewable area of 16.2". Digital control OSD, VESA, and NUTEK compliant DPMs, MPRI are standard with the unit and optional TCO is available. It's user controllable functions include Contrast, Brightness, Horizontal Position/Size, Vertical Position/Size, Trapezoid, Degaussing, Preset/Save, Colour Control, Memory Recall, Mode Display, Self Diagnosis and 16 memory preset and 25 user definable mode memory. The CMC-1703B comes with the compliance to VESA Display Data Channel (DDC) I2B specification designed to provide full compatibility in a plug-and-play environment and is compatible with Mac system.

For more information, contact Dellco at (905) 413-7290.



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Considerations on Selecting a Notebook

Notebooks — some people don't know what a 'notebook' is or what it can do. A notebook is what most people call a 'laptop', the term 'notebook' came about as it was about the same size as an 8.5" x 11" notebook. Today, a notebook can replace desktops in virtually all applications. Personally, I use a notebook for everything including photographic manipulation, 3D animation, and wouldn't trade it for any desktop. When you're looking to buy a notebook, there are a few things you should know besides the price and brand name.

PROCESSOR

Most notebooks today (with the exception of most brand name products) are capable of using CPU's found in desktops. Most entry level

By Michael Whitfield

FRESH NOTEBOOKS

Bondwell Pentium Notebook

3D Microcomputers introduces 2 Bondwell Pro notebooks. The systems are priced from \$3188.00 for the Bondwell Pro 575 to \$3588.00 for the Bondwell Pro 590.

The Bondwell Pro notebooks are available with 530 megabytes to 1.3 gigabytes of storage space. Processor options available include Intel Pentium 75 Mhz & 90 Mhz processors. All units are shipped standard with an Intel Pentium processor, 8 MB RAM, 16 bit sound card, PCMCIA Type II & III slots, Track ball pointing device, 1MB local bus video, Rechargeable NiMH battery, carrying bag & our ergonomic adapter.

For more information, contact CRMJ 472-0832



MegaImage introduces the MegaBook 770 and the new Pentium MegaBook 880

The MegaBook 770 multimedia notebook was designed to run today's most demanding multimedia applications. Available in 10.4" TFT active or STN passive LCD colour screens, the MegaBook utilizes 1MB of local bus video and provides simultaneous video display on both the LCD and any external device. This notebook offers optional processing power with the Intel DX4/90 microprocessor, storage (featuring 540MB, 810MB or 1.3GB removable hard drives) and expandability (from 4MB to 36MB).

Additional features include 2 PCMCIA Type II slots or 1 PCMCIA Type II and 1 PCMCIA Type III slot, a CableMaster II port, external monitor hook-up, an external Keyboard or PS/2 mouse/port and when fully loaded weighs only 6.4 lbs.

MegaImage has just announced the Pentium MegaBook 880. Offering all of the same great features in the MegaBook 770, the 880 model has been enhanced with the latest technology. The MegaBook 880 features an Intel Pentium 75, 90 or 100MHz microprocessor, 8MB of RAM (expandable to 40MB), an infrared port, Microsoft Windows 95, an 800MB removable hard drive (expandable to 1.3GB) and is available in a 10.4" TFT or DSTN LCD display.

For more information, contact CRMJ in Toronto at 905-940-3600 or Montreal at 514-345-9000 or in Vancouver at 604-621-0177.



FRESH NOTEBOOKS

Cyrus based notebooks from CTX at 486 prices

CTX, a supplier of color monitors and notebooks introduces Cyrus processor based notebooks. There are two models: the EaBook II, using the Cyrus 5686-100 MHz processor and the EaBook III using the Cyrus 5686-120 MHz processor.

The new EaBook 5686 series notebook computers offer higher performance than the 486 DX4/100 based models, but are comparably priced. Estimated street prices beginning at \$2,699.

The new notebooks provide write-back cache support to perform higher CPU benchmarks, along with 8 MB RAM expandable to 32 MB and an 8192B HD plus many other highly advanced features.

The EaBook 5686 notebooks have 10.4" diagonal TFT active matrix color displays that support 640 x 480 resolution, and can display 262,000 colors. When attached to an external monitor, EaBooks can display 1024 x 768 resolution at 256 colors.

A click rat allows users to swap drives easily. It also features built-in Sound Blaster Pro-compatible 16-bit stereo sound card along with a built-in speaker and mic, 3.5" 1.44MB internal floppy drive, 2 PCMCIA slots (one Type II and one Type III), EaBook's mouse pad pointing device. EaBooks come with Windows 95 and a carrying case. Options include PCMCIA 2x CD-ROM drive (\$299 SRP), PCMCIA fax/modem and Ethernet card.

Contact Custom Micro Systems in Canada at 800-273-8886 for more information.

IPC Notebook Launched in the Canadian Market

3D Microcomputers announces the introduction of 6 IPC NB06 notebooks. The systems are priced ranging from the IPC 313 at \$2699.00 to the IPC 5100 at \$7999.00. All units are shipped standard with an Intel Pentium CPU, 8MB RAM, 16-bit sound cards, PCMCIA Type II & III slots, Track Stick pointing device, 1MB local bus video (Intel i805) 9038 Port, Rechargeable NiMH battery, carrying bag, car cigarette adapter.

Contact 3D Microcomputers at (905) 473-8822



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notebooks use custom CPU socket mounts or surface-mounted technology. Proprietary CPU's require special daughter boards that have limited availability and a higher cost. A surface-mounted CPU cannot be upgraded to simply with newer technology. Limited expandability and expensive proprietary modules have marred the perceptibility of notebooks. An upgradeable CPU (PGA type layout) and convertible CPU lets the user upgrade to newer processors and develop CPU prices are consistently fluctuating up and down, long-term CPU prices always (unless in shortage) drop significantly.

MEMORY

As notebook manufacturers strive for smaller and lighter solutions, space is limited. Standard RAM modules are bulky and require a lot of room, as a result, manufacturers have to develop special memory chips that can less

space. There are a small number of manufacturers of SDRAM modules found in 144-pin desktop systems. Standardizing memory will bring advantages to both the user and requires some are turning to PCMCIA memory cards, but they lack speed, cost effectiveness and memory redundancy (many most are virtual memory) and not true DRAM. There is hope though, Microtek has developed a standard 64-bit DRAM memory module for notebooks. The DRAM module, although not in the market, will have a significant impact on sales of notebooks as pricing drops and capacities increase.

HARD DISK DRIVE

Hard drive technology is always changing, more portable, more rugged, and more powerful have moved products with 2.5" form factor, closing the price gap with the 3.5". Applications today not only require more capacity, but large

Notebooks are a viable and in many ways a better solution for users at home and in business. Before making any decisions, find a company who specializes in notebook solutions.

FRESH NOTEBOOKS

Toshiba sets new performance standard in multi-media notebook

Toshiba claims their Tegra 700C is the most powerful multimedia ready notebook. It features a 120 MHz Pentium processor, which converts 2.8 million 11.3" diagonal 600 TPI active matrix displays with full digital graphics conversion by a Chips & Technology 65548 PCI-based graphics controller, internal PCI bus, external PCI expansion for a video device, for support of 32 bit PCI Cards through the new Desk Station V docking station.

The Tegra 700C has 16MB of high-speed synchronous DRAM (expandable to 4MB), weighs 7.5-lbs, removable 1.44 gpi STD, SuperDisk removable device, two standard 16-bit PC Card slots that accept 2 Type II or 1 Type III cards and a long life lithium ion battery with an estimated 5 hours of operational time. Options are for CD-ROM reader which can be swapped out for floppy drive, 2 stereo speakers and integrated 16-bit audio that supports WAV, MIDI and Sound Blaster Pro sound files.

Windows 95 compatible. Uses advanced RAM that is faster than EDO DRAM and eliminates the need for expensive and power-hungry Level 2 caches.

The optional Desk Station V's external PCI expansion bus supports 32-bit PCI and 16-bit ISA, as well as Plug and Play and simplified card configuration. A built-in SCSI-2 port, 3.25" half-height bay and 2 Type III PC Card slots. SRP is \$6,199. Desk Station V SRP is \$999. 1 year parts and labor warranty.

For more information, contact Toshiba at (800) 387-3643

Toshiba midline notebook offers

Toshiba's latest Pentium 90 notebook fits into the new efficient, low cost line. The 4100 Series of multimedia-ready notebooks contains Pentium 90MHz processors for a 11.3" diagonal, 280K color displays with advanced video controller module for a 640x480, 16-bit audio, 16MB HD, 64B of 500 KRAM and lithium ion battery. The Satellite Pro is available in two models with different displays and CD-ROM configurations. The Satellite Pro 4100C has a 11.3" diagonal dual-scan color STN-LCD display and an internal floppy drive module, while the Satellite Pro 4100CDT features an 11.3" diagonal TFT active matrix color display and both the dual-speed CD-ROM and floppy drive module with an optional case. The 4100C can display 256 colors internally, the 4100CDT at 65,536 colors. Audio capabilities include 16-bit sound with WAV, MIDI and Sound Blaster compatibility, built-in mic and speaker, headphonemultiplier jack, microphone and line-in ports and pre-installed sound software.

An integrated AC adapter and CD-ROM (optional on the 4100C) cut travel weight and bulkiness, meaning the Satellite Pro 4100CDT weighs 7.5 lbs with CD-ROM module and battery and 4100C is 3.0 lbs with floppy and battery. The notebooks have Accupoint pointing devices and 2 standard PC Card slots (accepting 2 Type II or 1 Type III PC Cards). Both in infrared communications.

An Optional Enhanced Port Replicator allows docking to other peripherals.

The 4100C with standard memory, built-in floppy is \$5,599 SRP. Optional CD-ROM is \$519 SRP. The 4100CDT including interchangeable floppy and CD-ROM drives is priced at \$5,299 SRP. Three year warranty on parts and labor.

Toshiba can prove on sight of its notebooks including the Portege 4100C, Satellite Pro series and satellite series. Costs range from \$300 to \$1000.

For more information, contact Toshiba at (800) 347-3643.

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amounts of storage space as well. Three years ago a 40MB HDD was sufficient for most users, today it is a 520MB HDD (or larger). Disk space is a growing concern for many experienced users, and the need for upgradability is high. Many notebooks ship with a 260MB HDD, which stores fewer of today's programs and frustrates users who must pay premium prices to third-party companies for installing larger HDDs which may void the warranty. Fortunately, most reputable manufacturers allow for upgradability, but many require a proprietary casing that increases the cost by as much as 300%.

There are additional solutions, such as external or PCMCIA hard drives that are available in many capacities. Many external media devices connect via the parallel port. To get the fastest transfer rate, the notebook should have an ECP compatible parallel port; a standard port only transfers 150Kb/s and an EPP (enhanced parallel port) transfers 300Kb/s. ECP is designed for external devices and may transfer at 1,000Kb/s.

DISPLAY

Currently there are three basic screen types for notebooks: Monochrome Cathode Cathium Phosphor Tube (CCPT), Dual Scan Passive Triple-matrix Phosphor (DSTN), and a Thin Film Transistor (TFT) active matrix screen. LCD screens don't generate dangerous magnetic fields, freed from all CRT emissions. Even low radi-

Display Types:

TN LCD (Twisted Nematic Liquid Crystal Display) are made up of Polarizing Filters and Liquid Crystals, that twist 90 degrees. Twisting the crystals lets the light pass through the filters, untwisting the crystals allows the polarizers to block light. This is a low cost solution and is easy to manufacture, the problem is it does not work with passively driven screens with high multiplexing rates (lots of rows), low contrast, and the colors may bleed. To overcome the problem with high multiplexing rates, the STN solution was inspired by Dwight Semmen (AT&T) Schaeffer & Nehring of Brown Boveri.

STN LCD (Super Twisted Nematic Liquid Crystal Display) are made up of crystals that twist 180-270 degrees that use twisted crystals to a light frequency "rotator". The STN LCD has a much steeper slope to the transmission/voltage curve, resulting in a much greater contrast on high multiplex displays.

Single Scan 1/480 duty cycle (scans 480 rows per cycle), poor contrast and slow response 300ms refresh rate.

Dual scan 1/840 duty cycle (scans 1-840 and 241-480 simultaneously per cycle), fast response and good contrast, 150ms refresh rate which is good for static images or slow moving video (8 frames per second).

Notes: are the measurement of light from the display. The higher the nits the brighter the screen (average 65-100 Nits), need 210 Nits to work in direct sun light. The problem is the higher the nits the greater the power drain drastically reducing battery life and increasing cost. The trade is a paradox since users who need to use the displays outside also need better battery life.

Dual scan is available in mono and color displays. Dual Scan is not just color screens. Although DSTN color is accepted as a color display the correct terminology is CSTN or Color Super Twisted Nematic.

The lighting mechanism may also differ between displays, single tube and dual tube displays. A dual tube is a higher cost but will provide better brightness at a reduced battery life.

TFT active or Thin Film Transistor displays (active matrix) are the best display on the market currently, providing the highest contrast ratio and faster refresh 80ms, which is great for most video (15 frames per second).

A new active display is being developed called ASM, this display will offer a true high speed video or 30 frames per second and higher nits for better brightness. □

FRESH NOTEBOOKS



GVC ties its hand with notebooks

GVC, the well known modem maker, is now offering notebooks with the GVC Green 740 Notebook series. There are 3 models and offer the following features, approx 61bs, CPU and LCD upgradability, removable HD and floppy.

Options include 16-bit stereo sound system or battery, trackball or stick pointer, PC Card slots - 2 Type II or 1 Type III, interchangeable keyboard for other languages. Advanced Power Management for long battery life. RAM is 4MB expandable to 20MB. Power Management features include normal, sleep and suspend.

General Marketing 905-738-8300

Sceptre High speed Notebook

The new Sceptre Series 4000 model/notebook high-speed notebook uses the Pentium P54CSLM 130/133MHz processor and 11.3" active matrix screen with 800 x 600 resolution, built-in removable 4x CD-ROM which can be swapped with floppy or battery. HD is swappable with capacities to 1 gpg. 72-pin DIMMs expand from 8MB to 40MB. Keyboard has Windows 95 keys and a touchpad with palm rest. Sound Blaster compatible 16-bit sound, lithium ion battery with 4.5 hours of run time. Docking station can be hot docked and has PCI slots, 3 audio ports, MIDI and PS/2 connector.

SRP is US\$4,995 with 3 year warranty.

For more information, contact Sceptre at (818) 359-0686 or in Canada at (604) 244-7795.



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two models produce reduction levels that are relatively weak, prolonged use

Most users are familiar with monochrome CCFT backlit screens which have 16 to 64 gradations. Although the display itself is only capable of showing grayscale, the notebooks can display color on external monitors. Most manufacturers are no longer producing notebooks with monochrome displays.

Color passive screens have had many improvements since the Single Scan Passive Matrix came out and now approach the brilliance of active matrix screens. Dual Scan screens reduce in two different directions simultaneously, producing a faster refresh and clearer picture. A faint horizontal line in the middle of the screen, caused by the dual scan process, will be apparent until the display warms up. The Triple twist Piezoelectric is a better Dual Scan screen. DSTN screens have large viewing areas and greater contrast, which is better than other Dual Scan screens. DSTN screens are approaching the clarity of active matrix displays and it is sometimes

difficult to distinguish screen type when viewing a static image directly, but DSTN still does not have a fast enough refresh to display a smooth moving image.

The best display screen is the TFT active matrix screen. It has a perfect edge-to-edge picture and no focus variations give a clear and sharp image that is better than most VGA monitors. A fast refresh allows for easy cursor tracking and for viewing faster images such as video. TFT screens are made up of 307,200-transistors, each with its own RGB and light source. Active matrix have superior display quality, but also have higher power drain as the computer must drive each of the transistors separately. TFT technology is expensive as there is a high defect rate in production. Many entry level, even broad based, notebooks use TFT screen screens that may be comparable to a good quality DSTN screen. The TFT screens usually have a few dead pixels which show up when you display a full white page. The defect will appear as a few black spots.

FRESH NOTEBOOKS

Imaging shipping Pentium 133 Notebook/CD-ROM

Imaging Technology is shipping Eurocom's newest notebook, Model 5400, a dual Pentium 133 with PCI bus architecture. The Eurocom 5400 offers features including built-in CD-ROM, 2MB video RAM, 356KB of external L2 "Write-back" memory cache (expandable to 1MB), non-saving memory expansion via standard DIMM modules and removable hard drive based on enhanced PCI IDE technology at a capacity of up to 1.3GB. The Eurocom 5400 even includes a game/ADB port.

The Cirrus logic CL-GD540 VGA controller provides the following features: Built-in OLI acceleration, true-color capability, support for 600x800 LCD's, mixed voltage operation for low power consumption and support for MotionVideo Acceleration (MVA) for playback of Video for Windows AVI. The unit's 24-bit true-colour RAMDAC video controller supports up to 1280x1024x256 colours on an interfaced monitor and 1024x768x256 colours on a non-interfaced monitor (or up to 16 million colours at 640x480).

Eurocom 5400 is CD-ROM, voice and sound ready, incorporating internal CD-ROM and 16-bit stereo sound system with FM synthesizer, 2 built-in speakers, a microphone, external video jack and audio output jack.

List price for a Eurocom 5400, 10.4" TFT Active Colour with Pentium 75 CPU, CD-ROM, 8MB RAM, 340MB Hard Drive \$1295

For more information contact Imaging at 1-800-662-9372.



Smartbook Compact

Pacific Royal has introduced the Smartbook Compact computer. Featuring a 10.3" color DSTN color, easy upgrades using standard DIMM memory modules, a removable hard drive and local bus video in a 4.4 pound package. The DIMM module was developed in 1994 by Hitachi, designed specifically for notebook computers. The 4.4 pound Smartbook Compact is 486/33 has system that includes a PCMCIA type 3.0 or 3.0 slot, integrated floppy, front-centred 13mm trackball and NiMH battery. An ergonomic design includes wrist-rest and popular standard 10mm keys.

For more information, contact Pacific Royal at (800) 238-8212.



FRESH NOTEBOOKS

Jetbook CD5(F1)

Pacific Royal is introducing the Jetbook CD5, a 386/PCI multimedia notebook that has built-in CD ROM, 16-bit sound and an Optional MPEG module for CD movies. The Jetbook CD5 is designed to allow the user to use the CD ROM, floppy and battery simultaneously, with no swapping. It is utilizing the new DIMM standard memory modules and will support the Pentium 333mhz processor. Available in a three-year limited warranty and proven express service by Pacific Royal.

For more information, contact Pacific Royal at (800) 338-3212.

Ultima PYT/M Pentium Notebook

Specs: 75 or 90MHz Pentium processor, VESA local bus video and 32-bit removable HDD, multimedia notebook, 5MB RAM expandable to 40MB, built-in floppy, 640 x 480 DSTN color 9.4" or 10.3" 256 colors, TFT color 9.4" 256 colors, built-in speaker and mic, 16-bit sound, Sound Blaster compatible, PC Cards - 2 Type II or 1 Type III slots, 200 pin VESA bus docking station connector, 19mm (rackable) pointing device, weight under 6.5 lbs.

For more information, contact: (416) 862-2064

Texas Instruments' smart notebook batteries

Texas Instruments' feature set 90MHz Pentium processor with PCI bus, 256KB Level 2 cache, 1.2 GHz HDD and 1.44MB floppy, 16-bit active color display with 65k colors and 2MB VRAM, 4MB RAM expandable to 32MB, PCMCIA slot can take 2 Type II or 1 Type III cards, built-in 16-bit sound, internal speaker, dual mode mic, interfaces for radio input and real-time video with Intel Indeo video software, infrared port.

Battery system includes two lithium ion with nickel-zinc power system that was awarded from PC Magazine's Editor's Choice Award. Has best battery life for Pentium notebooks.

Street price \$5,399 comes with Windows 95

For more information, contact TI at 903-770-3123

Do you know?

On average, with a twelve cell battery, the first cells are damaged by the time the last cells are charged.

BATTERY

Most notebooks have moved away from using the old industry standard NiCad (Nickel Cadmium) battery pack towards the more efficient NiMH (Nickel Metal Hydride) battery. NiMH batteries not only provide more power, but don't have memory problems that plagued the recharge ability of NiCad batteries. Lithium ion batteries are another solution. Lithium ion batteries, unlike NiMH batteries, generate about the same amount of power as NiMH batteries, but at half the weight. Lithium ion batteries are charged in series, one cell at a time. On average, with a twelve cell battery, the first cells are damaged by the time the last cells are charged. To avoid this, then,

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Customers with only one PCMCIA Type II slot should not worry - there are adapters to convert a Type II into a Type III, since the only difference is the thickness of the slot and not the connector.

manufacturers limit the number of cards (usually to one 7.5 volt card) causing a dramatic 30% cost increase over NMH laptops.

PCMCIA SLOTS

PCMCIA (Personal Computer Memory Card International Association) standard is available

in three types: I, II & III, the type IV PCMCIA, developed by Toshiba, is not yet a recognized standard. PCMCIA x240 interfaces (Type I and Type II cards, the most common found in Type II) Only hard drives are available in Type III at this time. Customers with only one PCMCIA Type II slot should not worry - there are adapters to convert a Type II into a Type III, since the only difference is the thickness of the slot and not the connector.

PCMCIA technology allows many add-on devices available for desktops, to be used in laptops. As technology advances, PCMCIA cards in the near future will be able to incorporate many functions on one card, as well as having hot swap capability which allows the user to change cards in the middle of the application. Not all PCMCIA cards are the same, compatibility, memory requirements, and installation are considerably different from desktop systems. Contact your reseller for specifications.

SUMMARY

Notebooks are a viable and in many ways a better solution for users at home and in business. Since most resellers know less about the industry, they tend to neglect notebooks or give them little thought. Service is the most important issue, fast turn-around and knowledge are paramount, do not be fooled into thinking that only brand names are the best solution, most brand names don't do their own service and my experience are usually empty ones. Before making any decisions, find a company who specializes in notebook solutions. Unfortunately most companies tend to do everything and the age-old saying, "a jack-of-all-trades and a master of none" is more true than ever. □

About the author: **Michael Whitefield** works with Pacific Royal, a notebook distributor. He can be reached by phone: (804-279-8751 or 800-338-5177.

FRESH NOTEBOOKS

Epson's ActionNote notebooks

Epson's ActionNote 880 series of notebooks is based on the 3.3 mHz clock tripled with 8KB integrated write-back cache Cyrix DX4-class 386 MHz processor and they use the 894C, 894E, 8946C and 8946D. The 894C features dual scan displays, the 8946C and 8946D feature an active matrix TFT display. All have removable 340MB HDs.

The ActionNote 895C and ActionNote 895CA are multimedia capable with a built-in 16-bit SoundBlaster compatible stereo audio card, internal mic and speaker. There is an integrated 14.4 fax/modem/modem.

The audio card and fax-modem are options on the other models.

All ActionNote 880 series notebooks have ActionPoint optimized printing devices: Windows 95 compliance, 8MB RAM expandable to 24MB and stacked PC Card slots. Software bundles include a choice of MS-DOS, MS-Windows or Windows 95. Also included are Lotus SmartSuite, trial subscriptions to the Official Airline Guide Flight Desk for Windows, Prologix, CompuServe, America Online, NetCom, NetCrawler, ARK Webpage, PC card services and utilities and on-line documentation. Systems with built-in fax/modem include WinFax Lite and WinClerk Lite.

Options include: enhanced ActionPort Replicator, a Kensington Security Cable and an expandable 800MB HD. One year Road Service warranty which is a rapid response program for overnight replacement of the notebook should there be an unsolvable problem. Prices for the 880 series start at \$3,399.

Contact: Epson 800-284-5770

NEC Verso 4000 Notebook

With up to 900MHz of Pentium power, the NEC Verso 4000 combined with a 13.4" High Resolution 600 x 600 TFT display and CD-ROM access. The interchangeable CD-ROM Pak (standard on two models) slides easily into the front-mounted VersoBay™ slot. Sound, at 16 bits, pours through the two top-mounted speakers while full-motion video is displayed across a brilliant screen. An internal microphone is right below the screen. Memory starts at 8MB (upgradable up to 40MB). Hard drives available in 340MB and 510MB (upgradable to 1GB). Two PC Card slots for incorporating more equipment.

For more information, contact NEC Technology Canada at (905) 763-3608.





By Gary Davis

Keeping vital information safe

"To drive out of visibility and secrecy! Through you we learn to be invisible, through you invulnerable and hence we can hold the money's fate in our hands." See *Tao Te Ching* (38th century B.C.) Chinese proverb. *The Art of War* (6th c. B., approx. P. ch. 49 & C.; ed. by James Clavell, 1967).

It's not exactly a battlefield anymore, but all of us from time to time feel the pinch of economic competition.

The strategies we rely on to protect our positions reflect the level of competition, and our sophistication in dealing with it. Economic barriers to competition are increasingly being augmented by claims of legal rights.

The approach of Western law has been to expand the concept of property rights to knowledge. The "owner" of the knowledge is treated with an exclusive right to use the knowledge for a fixed period of time. In return, the creator publicly discloses the knowledge. The rationale for giving this monopoly is simple—when the property right expires, the information is available for public use.

Not surprisingly, this has translated into a blossoming awareness of knowledge-based property rights, commonly referred to as intellectual property. Patents, copyright, trademark and industrial design laws are well known rights. But did you know that there is a fifth type—trade secrets?

One of the most famous trade secrets is the recipe for the soft drink "Coke." In the manufacturing and distribution business, trade secrets might include customer lists, mailing lists, business plans, drawings of devices, and internal business policies such as pricing and estimating.

To qualify as a trade secret, the information must have some value to the person possessing it, the information cannot be widely known, and some effort must be made to keep the information confidential.

The kinds of information that might be called trade secrets are virtually unlimited, and depend on one's business. As an aside, it remains to be decided after the source code of publicly distributed software qualifies for trade secret protection.

Trade secrets can also be protected by other forms of intellectual property rights. For example, obtaining a patent may be an alternative to relying on trade secret protection.

There are pros and cons to each choice. If you rely on keeping your knowledge secret, your protection would last as long as the information meets the criteria of a trade secret. If you obtained a patent, the property right would expire in twenty years and your secrets would be published as part of the patent process.

Trade secret protection does not need a contract between parties to give rise to protection. The famous Canadian case of *LAC Minerals v. Corona* was decided on the basis that information given to LAC was disclosed on the understanding that it would be used

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M D Y

Are you involved in the selling, reselling, and/or distribution of computer/networking systems, software or services?

☐ Yes ☐ No

Which best describes your job function? (check one only)

- ☐ President/V.P./owner/ps
- ☐ Branch, area, district, regional managers
- ☐ Channel, retail, value added resellers and managers
- ☐ Purchasing and merchandising managers
- ☐ Product development managers
- ☐ Computer consultants
- ☐ Technical management
- ☐ Design, systems and applications engineers
- ☐ Marketing, sales managers

COMPLIMENTARY SUBSCRIPTION

Which best describes your firm's primary business? (check one only)

- ☐ Hardware/software reseller
- ☐ Mainframe reseller
- ☐ Computer electronics/ITC machine reseller
- ☐ Value added distributor
- ☐ Distributor/wholesaler/business manufacturer/CM
- ☐ Software developer
- ☐ Systems integration/software consulting
- ☐ Government purchasing agent
- ☐ Computer maintenance/repair company
- ☐ Other third party and related service firms

The system my organization integrates or relies are based on the following: (check all that apply)

- ☐ DOS/Compaq
- ☐ Networking
- ☐ UNIX/Compaq
- ☐ Unix
- ☐ Windows NT
- ☐ Macintosh

What is the number of employees at this location?

(check one only)

- ☐ 10,000 or more
- ☐ 5,000 - 9,999
- ☐ 2,000 - 4,999
- ☐ 1,000 - 1,999
- ☐ 500 - 999
- ☐ 250 - 499
- ☐ 100 - 249
- ☐ 20 - 99
- ☐ Less than 20

What are your firm's approximate gross annual sales?

(check one only)

- ☐ Over 150 million
- ☐ Over 100 million - 150 million
- ☐ Over 50 million - 100 million
- ☐ Over 10 million - 50 million
- ☐ Under 10 million
- ☐ Over 25 million - 50 million
- ☐ Over 10 million - 25 million
- ☐ Under 10 million

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only for the purpose of deciding if the two companies would jointly develop a proposed mine. When LAC acted on the information and obtained property which would later form part of the mine, Canon used clearing-ownership of the property. The Supreme Court of Canada awarded the property, which by now had been turned into a mine, to Canon provided that they paid LAC's development costs.

All of us at some point have been asked to sign a non-disclosure agreement. Should you be signing one too? The answer is most emphatically yes.

All businesses have some information that would harm their competitive position if it became public knowledge.

Most compelling, if the knowledge is made public, it can never regain the status of a trade secret. For those businesses considering patent protection, a non-disclosure agreement is a must when disclosing information about the invention before the patent is granted.

Legal scenarios aside, we can hardly expect employees to keep secrets if we do not coach them - and an agreement will serve to record their commitment in writing.

A management plan is a key component of a strategy to protect intellectual property rights. The first step in any plan is to identify what information is important to your business. If (1) identification is followed up with (2) an examination of how the information is stored, (3) who has access to it, (4) how it is tracked in confidential, and (5) how it is used, you might well identify where remedial action is required.

Your employees are a key element in the planning process. Often they know more than anyone about the company's trade secrets.

Common outcomes of the planning process are restricting availability of information to a need to know basis, educating your employees regarding disclosure and controlled or controlled storage of information. The planning process can also help you become clear as to what information gives you a significant competitive advantage. Learning more about your business can never hurt!

A periodic review will help you ensure that your internal policies are in tune with your business.

Not surprisingly, your own organization is often the best source of information about your secrets. Consistently, businesses fail to identify information as confidential when disclosing it -

and assume that a non-disclosure agreement is enough. But these very agreements usually require that the information be marked or otherwise identified.

Day to day business activities also give rise to many opportunities to unwittingly make secrets public knowledge. When you apply for a government grant, a loan, provide information to a manufacturer of your product, contract out research and development, or just provide plant old information to a prospective business partner, your secrets can be lost to you by becoming public knowledge. The careful use of a non-disclosure agreement might save the day.

Many areas of the United States have legislation dealing with trade secrets. Caution is advised when doing business in these areas to ensure that your non-disclosure agreement complies with local legislation. This is in addition to any agreement about what laws apply to the contract - an important point in this age of global commerce.

Returning to the home front, if an employee takes your secret information, you have remedies that are based in employment law. Most commonly, the remedy sought is to prevent the use of customer lists and other information that a sales person might take.

(Continued on page 39)

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WHAT TO DO IF YOU'VE GOT ALL THE INFORMATION IN THE WORLD.

Just when you thought you
already had all the data your
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could possibly handle, another
whole world comes along.

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Frequently Asked Questions:

Pentium Pro (686)

Information from Intel Corp.

Does software need to be recompiled to gain a performance enhancement on the Pentium Pro processor?

No. The Pentium Pro processor is designed to deliver optimal performance with 32-bit software. But you can also run the same software that you're using today and gain a performance boost. The Pentium Pro processor schedules instructions in run time dependent upon data availability. This means that the Pentium Pro processor performs well on any code designed to run on previous generation 32-bit Intel processors.

What is Dynamic Execution?

It's a phrase that Intel developed to describe the Pentium Pro processor's unique combination of Multiple Branch Prediction, Outflow Analysis, and Speculative Execution.

To implement Multiple Branch Prediction, the Pentium Pro processor contains a Branch Target Buffer which is used to store and faster to step in the code implemented on the Pentium processor. The Pentium Pro processor also employs a more sophisticated, history-based prediction algorithm. For Outflow Analysis, the Pentium Pro processor analyzes which instructions are dependent on each other's results or data, to create an optimized schedule of instructions.

Instructions are executed speculatively based on the optimized schedule, keeping all the chip's superior processing power busy, and boosting overall software performance. The Pentium Pro processor core also includes a retirement processor which ensures that instructions are completed in the same order as a Pentium processor would have completed the instructions.

What will Pentium Pro processor performance look like in the future?

The first Pentium Pro processor will be produced on a 0.6 micron manufacturing process. Intel is already preparing to move Pentium Pro processor production onto the newer 0.5 micron process — the same process that the new 133 and 133 MHz Pentium processors are currently produced on. This will allow the Pentium Pro processor to operate at higher frequencies.

The Pentium Pro processor looks different than other chips. Will a Pentium Pro processor fit into a Pentium processor socket?

No, the Pentium Pro processor has a quite different foot print. The Pentium processor has so it is not designed to be compatible.

The component bus of a Pentium processor is designed to attach to an external L2 cache and includes features to optimize CPU-to-cache data transfers. In contrast, the first Pentium Pro processor includes a 256KB L2 cache in the same package and the CPU communicates with its L2 cache using a private internal bus. The component bus of a Pentium Pro processor is designed to interface to a cache coherence memory bus and includes features to optimize cache-to-memory data transfers.

What about the thermal and electrical specifications? How hot will it run? At what voltage does it operate?

Power dissipation is proportional to the speed of the processor and to the square of its supply voltage. The first Pentium Pro processor operates at 133MHz with a supply voltage of 3.3 volts and dissipates a theoretical peak of 30 watts. However power dissipation for all processors

also depends on the software being executed. For most typical patterns of code, power dissipation for the Pentium Pro processor is roughly around 14 watts. Cooling Transistor Logic (CTL) was chosen for the Pentium Pro processor but signaling voltage were still independent of processor voltage and made its smaller voltage swing enables faster operation.

What are the advantages of an in-package L2 cache?

Having the L2 cache in the package not only simplifies system design and save space, it also means the CPU core can communicate with the L2 cache at full speed. Additionally the cache is non-blocking which means that instructions on the Pentium Pro processor bus don't stall the processor or block subsequent bus transactions. For example, when a cache miss occurs, the Pentium Pro processor continues to process other instructions while waiting a bus transaction to empty the cache bus; these instructions need generate additional cache misses which could cause more bus transactions. The Pentium Pro processor can maintain up to four of these outstanding transactions.

Will multi-processing be easier with the Pentium Pro processor?

The Pentium Pro processor has was designed to support multiple Pentium Pro processors connected as peers. The Pentium Pro processor component bus is a system bus supporting bus-to-bus full support for the MESH protocol. "Glueless" MP Pentium Pro processor system design are supported; that is, no additional system logic is required for multi-processor designs. The Pentium Pro processor includes effort the logic required to directly support the interconnection of up to four Pentium Pro processors. This means that it's very easy to add scale-to-five (in system designs) to include multiple Pentium Pro processor processors, essentially by just providing sockets for the additional processors.

Is there a new instruction used by the Pentium Pro processor? What does it do?

A conditional move instruction was added which may be used by compiler writers as an alternate to a "test and set" instruction.

This allows a code dependent branch to be eliminated. The resulting code will be more predictable by the processor and will thus deliver higher performance.

Is the Pentium Pro processor a 64-bit processor? Does it support 64-bit integer instructions?

No. Like all Intel processors since the Intel8086 processor, the Pentium Pro processor is a true 32-bit processor. The general purpose registers are the same as on previous generations of Intel Architecture processors and the instruction set is supported with only one new instruction being introduced.

However there are a variety of wider datapaths both inside and outside the chip. One visible feature that is sometimes misunderstood is that the Pentium Pro processor, like the Pentium processor, has an external 64-bit bus in order to communicate more efficiently with system memory. This wider external datapath increases bandwidth between the Pentium Pro processor and the system, but doesn't make the Pentium Pro processor a 64-bit machine.

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Frame Relay and T1 Lines

By Sean Elington

Over the last few years, Frame Relay technology has become the transmission medium of choice for companies replacing expensive dedicated leased lines. Unlike leased lines, which are private, point-to-point connections, Frame Relay sends your data through a public data network.

Data sent through the network is packaged in "frames" and "relayed" from switch to switch within the network. Just as ordinary telephone calls are routed through a public switched phone system, if you use a Frame Relay network your data packets share the switches and traffic lanes with other people's data.

The idea of public networks devoted solely to data is not new—in the 1970s the telephone companies introduced the X.25 standard as a way of sharing public data networks. The trunk lines in those days were nowhere near as reliable as they are today, so the X.25 standard included a lot of overhead for error checking and correction. This was done at each switch as the data packet traveled through the network. The protocol required a lot of extra information sent with each packet to ensure that it arrived at the destination intact.

Frame Relay takes advantage of modern telephone lines' low error rates and leaves error detection to the computers at either end of the link which actually receive the data. If a packet is corrupted in transit, the applications running on your computer will detect it and request that the sending computer re-send the packet. This means that Frame Relay does not need the elaborate error-checking mechanisms of the old X.25 networks and is able to handle much more data more quickly.

The public Frame Relay network is often referred to as "the cloud" and is usually shown as a cloud-like shape on network diagrams. In order to access the cloud from your office you will need to buy a dedicated connection to the nearest point-of-presence (POP) provided by your phone company. (Unlike ISDN, which is a local loop service provided only by BC Tel, the market for Frame Relay services is hotly competitive with FORTWORLD, Sprint Canada, United World and BC Tel all providing service.) This dedicated line is usually a 56,000 bps line, although you can get faster access lanes if you need them.

Frame Relay is very scalable and therefore very cost effective. You buy a *Committed Information Rate* (CIR) from the telephone company which is the amount of data that your carrier guarantees will always be able to get through the network. Even though you might have a 56 Kbps line into the cloud, you might only send an average throughput of 16 Kbps through the cloud so you pay only for the amount of bandwidth you actually use.

The Frame Relay cloud is not terribly busy in Canada so you can "burst" up to 56 Kbps and still take a chance that your data will get through. When a Frame Relay packet enters the cloud there is a bit called the "discarded eligible" (DE) bit which is switched on or off. If the cloud is temporarily busy, any packets you send in excess of your CIR are marked DE and are discarded by the network. This

doesn't happen very often (although it might as the cloud becomes busier over the next few years) but if it does then you will have to retransmit your data.

If you want to connect your LAN to a Frame Relay network you will need a router. Virtually every router on the market provides integrated Frame Relay software support, however, there are some important differences among them. You might want to look for a router which supports *Forward Explicit Congestion Notification* (FECN) and *Backward Explicit Congestion Notification* (BECN). FECN and BECN are packets sent by the cloud to your router telling it that the cloud is congested. Your router should slow down the rate at which it is pumping data into the cloud, and if it doesn't, then it will continue to pour out data which may be discarded to be discarded.

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A router can also prioritize your traffic by allowing some packets to have precedence over others. This can be very handy when you have many users competing for bandwidth. Database lookups which directly affect customer service, for example, can be given a higher priority than file transfers or email.

When choosing a Frame Relay router you should also look for an easy to configure interface, a fairly fast processor and a migration path to ATM (*asynchronous transfer mode*). Frames used in Frame Relay vary in size depending on the protocol being used. ATM frames are the same size regardless of the protocol. Just as standardized containers make shipping more efficient, standardized data packets can move through the network more quickly. ATM holds a lot of promise and you will want to have a migration path from Frame Relay to ATM as it becomes available.

If you just need to connect terminals or PCs to a Frame Relay network you can use a *Frame Relay Access Device (FRAD)* rather than a router. These units cost about \$1000 and up depending on how many ports you require. FRADs are

very useful when dealing with nonstandard protocols like SNA because if you use a router, those protocols must be encapsulated in another standard protocol like TCP/IP which significantly increases the size of the packet.

Recently, several vendors have come to market with "voice over frame" units which allow you to use your data network to also carry voice traffic. A company with an under-used Frame Relay network can save a lot of money if the spare bandwidth is used to send packets of voice data. The savings can be huge for companies with international networks and lots of overseas telephone lines. Because voice traffic is time sensitive (i.e. we can't have huge gaps in the middle of a sentence), a voice over frame unit must have a fairly large buffer and fast processor to avoid delays or latency in the transmission. Look for more of these types of products to hit the market soon.

On a different note, people sometimes see ISPs advertising a "T1 connection to the Internet" and wonder what it means. A T1 line is 24 lines combined into one physical phone line capable of transmitting data at 1.544 Million bits per second (Mbps). The T1 connection to the Internet means

that your ISP gets that Internet feed at 1.544 Mbps. Your ISP may also be bringing in user's calls via a T1 line rather than having several individual phone lines.

By the way, a T3 line is 96 lines combined into one physical phone line capable of transmitting data at 6.312 Mbps. A T3 line is 672 lines combined into one physical phone line capable of transmitting data at 44.736 Mbps. T1 lines are quite commonplace and common in the United States. In BC it costs more to get a T1 line than it does to get 24 ordinary phone lines so there is not much incentive to do so.

Note: Colin MacGillivray of C T&S emailed me that the GTD5 switches I wrote about last week will support ISDN in 1997 and the existing switches in place throughout BC will be upgradeable. This is good news because it may allow BC Tel to roll out ISDN more quickly around the province. ☐

About the author: *Sean Elbrington* is Marketing Manager of ZED Data Systems, he can be reached by *sean@zedon.com* or voice (604) 473-9337.

(Continued from page 33)

Keeping vital information safe

A non disclosure agreement can expand the kinds of information that the employee is obligated to keep secret. These provisions can be incorporated in the employment agreement. And to increase the chances that the agreement is enforceable, the best time to obtain the agreement is during the hiring process.

In British Columbia, the *Freedom of Information and Protection of Privacy Act* obligates public bodies to disclose or request certain information. This can have unintended consequences if the information disclosed is about your business or technology. For example, if you are licensing technology from a university or other post secondary body, it may be possible for the public to obtain information about the technology.

Fortunately, there are exceptions to the rule in the legislation. It is a good idea to consider these exceptions carefully. Assuming you meet the tests, precedence suggests including a provision in your agreement with the public body acknowledging that the exceptions apply and the need for confidentiality.

And for every business, the challenge is to craft a protection strategy, within a budget, combining trade secret protection with other intellectual property rights. ☐

About the author: *Gary Owen* practices law in Vancouver in the areas of intellectual property, securities and licensing. He can be contacted at 604-779-7511 or at *gary@duan.com*.

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The fast changing world of the laptop

By Edward Trupinski

Technology is changing so quickly, computer manufacturers say there is a new trend in mobile computing every four months. Last month at Comdex, the mammoth Las Vegas computer show, vendors were showing the latest laptops. Normally everything that is new for the year, with minor modifications here and there, would be on display. The rate of change

is so rapid in mobile computing, the most stability we can hope for is three months.

The current hot-lap laptop vendors are betting with Apple the role is tipped again in four months or, at least, a Pentium 75 megahertz microprocessor enhanced battery life, ergonomics with palm rests, and new pointing devices, wireless communication connecting to the Internet through

a cellular phone connection or infra-red ports, multimedia and CD-ROM, modular and customizable components, and lower prices at the mid-end with more features at the top end.

Mobile Computing is still the fastest growing portion of the computing industry. This year 80,000 laptops have been sold so far. The forecasted growth for next year is at least 150 %.

The Microprocessor

In terms of microprocessor speed, the gap has narrowed between what is available on the desktop and what you can carry around in the field. Top performance for mobile computers right now is a Pentium running at 133 megahertz. With Intel shipping enough Pentium 133s to meet demand, it makes Pentium 75 the more affordable and widely available for most manufacturers, and for some, it will mark their entry level notebook.

The shift towards Pentium in mobile computing only began in the third quarter of this year. The 486-DX remains the most widely distributed processor and it probably will still be in the first quarter of 1994. But by the second quarter the majority of notebooks sold will be Pentium based.

IBM and some other high end vendors are also using equivalent processors from Cyrix and AMD to lower the cost. In the Apple world, the PowerPC 601 is the high-speed processor of choice for PowerBooks.

Operating software, like Lotus Notes, which enables communications between offices and the field salesperson, has driven the need for more powerful CPUs. With mobile sales presentations involving beyond simple slide transitions into the sphere of multimedia and full motion full screen video, you need the power of the Pentium 75, and up, to get the audio quality and jerk-free video playback necessary for video, audio and 3-D animation. Also by taking advantage of the performance of the Pentium 75 chip, hardware manufacturers are integrating hardware accelerated components, building in MPEG decoder chips and putting speakers and microphones right into the lid of the notebook.

"One of the big programs at Intel is to see what we can deliver with the added performance," says Doug Cooper, architecture manager for Intel Canada. "We are taking the available MIPS in the laptop and enabling functions by simply adding a new piece of software to the system. The distinction between hardware and software blurs."

Intel has recently developed a specific miniaturized low voltage microprocessor, Mobile Pentium, to manage battery drain and heat dissipation, further encouraging the migration of technologies from the desktop to the laptop. Before, it took about a year for a desktop chip to make it to a notebook. The Pentium 75, prevalent on the desktop in the second quarter of this year, is already used in laptops in the fourth quarter. So that leaves mobile only two to three quarters behind the desktop in microprocessor power.

Battery Power

"People tend to be amazed that when the Pentium comes out in the desktop it should

Handhelds companion to other PCs

By Edward Sposato

The other growing opportunity for wholesalers is mobile computing in the increasingly growth in the popularity of handheld devices. These are the personal digital assistants (PDAs), personal organizers and palmtops like the Sharp Zaurus, the new Hewlett-Packard OmniGo, and the Apple Newton.

As these devices, which fit into the purse or breast pocket of your jacket, get smaller they are also increasing in functionality. The processing power of the ubiquitous microframes of the 1990s is now available to carry in your pocket and run off simple AA batteries.

These ever shrinking devices have the capability to run numerous laptop applications and allow users to access, create or analyze data and communicate either wirelessly or

with wires through the modern, PCMCIA cards or pager cards. As non-proprietary standards develop it also means that it won't matter what brand of laptop or desktop you buy. Your PDA can connect to any of them.

Unlike laptops or notebooks, which in many cases are used instead of desktop computers, handheld devices are usually used in conjunction with other technology. Hewlett-Packard, for instance, positions its palmtops and handheld devices as "the PC companion." Rather than displacing the laptop or the desktop, HP sees these devices working in tandem with these other products. For any wholesaler, they extend the line of PC offering.

Generally speaking with standard AA batteries and without backup, these PDAs weigh in at less than 12 ounces. (The

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(Continued from page 41)

come out simultaneously in the laptop. But that's not reality," says Alok Sarma, president of Impulse Computers, which only sells portable technology. Because notebooks use batteries, power consumption affects the pace at which new technology can be adapted to the mobile arena.

Battery technology, especially lithium ion batteries, is slowing the transition of features like multimedia and CD-ROM to the mobile environment. With lithium ion batteries you get about double the battery life of nickel metal hydride.

As batteries get lighter and last longer, more components are put into laptops, which use more power. Three hours is still the three limit that users can reliably expect from their notebooks.

Sony is a major supplier of lithium ion batteries. Sony recently had a fire in its lithium ion plant which may affect the supply for awhile.

Ergonomics

Notwithstanding the added features, even the most loaded notebooks are anything within the range of 6.5 to 8 pounds. The real weight barriers are being broken in the ultra portable sub-notebook segments which might weigh as little as 4.5 pounds without losing any functionality.

With fewer moving parts, less cleaning and higher accuracy, touch pad and pointing stick devices, rather than mouse or trackball, have become the dominant pointing device on new laptops. In a mobile environment you never know if you're going to have a place to put your mouse. Think of how cramped the seat trays are on many airplanes.

Toshiba, Compaq, AST, and IBM, for one of the mobile computing industry, are using the pointing or track stick. NEC, Texas Instruments and Epson opted for the track pad. Michael Garbo, the Canadian representative for Cirque's GlidePoint track pad says toggle pens are tougher to use than track pads since from the time we said, "It wasn't me, it was him," the finger is the pointing device we understand best.

Eventually, industry observers suggest, the easiest way to point will be to touch the screen.

Track pads are gaining popularity because it has become a fashion statement, says Alok Sarma. "Notebooks are like clothes. You take them with you and work on them in a public environment when other people are around."

Other ergonomic features now standard are palm rests, full size tilted keyboards, and larger screen size. The premium screen for notebooks is now a 12.1 inch diagonal SVGA.

TFT screen. The 10.4 inch screen, which was the premium last year, is now standard on the value line.

Apple with its popular PowerBooks was really the first to incorporate track pads and palm rests concentrating seriously on the look and feel of the mobile product.

Especially in the mobile world, they found, comfort makes a big difference in the acceptance of a product. "If it's not comfortable, you don't use it," says Sue Belanger, mobile product manager for Apple Computers. "It has to be comfortable whether it's on your lap, on a desk, or if you're lying on a bed in a hotel room. It has to feel the same."

Wireless Communications

Could this year could have been mistaken for a telecommunications convention or an Internet congress. Getting on the Internet means using a modem to connect to a remote computer. This trend in computing can be categorized as Information in Motion. The very nature of mobile computing has always constituted remote connectivity.

Cellular, infra-red and other forms of wireless communication, as well as copper wire land line, are ways mobile computers interconnect. Although not all the applications that use these capabilities are there yet, users are looking them on their desktops preparing for when it does happen. Today thirty seven per cent of all laptops are shipped with infra-red capability. By this time next year that proportion will grow to well over eighty per cent. IBM says every ThinkPad it ships from now on will have infra-red.

Infra-red allows multiple devices to share the same equipment. So you could, for instance, have a desktop, a laptop and a PDA all using one printer.

Computing by remote control is becoming increasingly attractive to people who travel or telecommute. Using a modem and Norton's PCANYWHERE software you can work just as if you were actually sitting at the PC you are calling, meaning that an entire application or database doesn't have to be downloaded to the remote computer. It brings the McLuhanesque idea of the global village that much closer.

Portable computers have been cellular ready for some time now, but until now, users have not taken advantage of the capability. With the digital evolution of cell phones, and the development of Personal Communication Service networks, the transmission of data by cellular phone becomes more feasible and reliable.

"You're seeing an increased demand in cellular data connectivity," says Casey Witkowski, director of marketing for the Motorola Information Systems Group, which sells modems and PCMCIA cards. "The people who bought their

cellular phones a few years ago, are saying, 'Now maybe I can receive a data call and respond instantly.'"

Multimedia

"There is nothing that a notebook computer can't do that a desktop can," says Robert Grossman, vice president and general manager of Toshiba of Canada Information Systems Group, which only makes notebooks.

Toshiba's newest product, the 120 MHz Pentium based Toss 700CT, is a full multimedia machine. With a 1.2 gigabyte hard drive, integrated quad speed CD-ROM and stereo speakers it is as sophisticated as any desktop. "With more and more applications being written for CD-ROMs, operating systems delivered only on CD-ROM, and data storage stored on CD-ROM, there is no doubt CD technology will really boom," Mr. Grossman says.

Many sales professionals use their notebooks to make presentations. By adding sound and full motion video the mobile computer becomes an essential and powerful sales tool. Bigger and more interactive databases are becoming and more readily accessible on CD-ROM.

Handheld companion to other PCs

technological breakthrough we waiting for is battery development," says Sharp Electronics of Canada mobile communications product manager, Larry Breakwell. "Battery development is slowly developing and will always be an issue for these handheld devices."

Priced at around the \$500 range they allow customers to communicate via cellular for e-mail, messaging and on-line services. They can connect via infra-red or cable to a desktop for file management and backup. Infra-red also allows computers to communicate with non-computing devices. Public pay phones now being developed have infra-red connectors built in so if you take infra-red ready handheld or notebook you can dial and put it at the phone you don't need an acoustic coupler or external modem to transmit data. The next generation of Personal Communications Service phones, like the latest Nokia phone, have infra-red and the data-coupled built into the base of the phone so all you have to do is point and shoot.

Because price and size is a consideration at the handheld level, you won't find a full-sized keyboard or full function applications. Instead, there are strong

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Screens will enlarge to take advantage of the increased video and animation possibilities. The Tera already has an 11.3 inch TFT (thin film transistor) colour screen but the size of displays are, however, limited by weight and form factor.

Modularity

The ability to replace a floppy drive with a CD-ROM or the ability to put in an extra battery allows the user to customize the notebook according to his or her needs. Depending on whether you want more computing time, or if you have a lot of data on a CD-ROM disk, you can configure for your requirements.

"When you think about it, it makes sense," says Eric Dubois, notebook product manager for Compaq Canada. "People buy notebooks for different reasons. On our high-performance LTE 9000 not only can you customize your notebook you can also customize your expansion space."

Open standards for modularity are still not here. For the most part the modules you can mix and match are those within the same manufacturers' line. So you can't stick in the best of each component, regardless of origin.

Price Point

As more features are added to the mobile platform the price goes up. But so the absolute price goes up so does the absolute value. "Every business quarter your money buys you more," says Peter Sutherland, mobile brand manager for IBM Canada.



What was the top of the line IBM ThinkPad exactly twelve months ago, with a 486-60 X 4

processor, is now squarely in the high volume value sector.

There are now three well defined segments in the notebook marketplace. At one time portable computing constituted high end premium models only. Now all manufacturers are striving to develop value lines. The base

Handhelds companion to other PCs

applications for personal information management like tracking daily appointments and expenses, taking notes, organizing addresses and telephone numbers, and computing financial information. It is also at the level of handheld devices that the convenience of pen navigation really works when it is coupled with the familiarity of a keyboard, no matter how small.

Sharp's Larry Brockwell wants to see the Sharp Zaurus Electronic Organizer marketed as the laptop sector because it does a lot of what the laptop does at a fraction of the price.

"This is a mainstream product that has all the features and more that a user would want, positioned in an appropriate price point," says Linda Blakely, handheld product manager at Hewlett-Packard Canada.

(Continued on page 46)

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Re: Your ad and listing in Canadian Computer Wholesaler
_____ Issue, page _____

Please quote on your products as described below

Product name / Model Numbers	Quantity
_____	_____
_____	_____
_____	_____
_____	_____

Detailed specifications, requirements, applications:

- ☐ Please fax me information
- ☐ Please send catalogs/prices
- ☐ Please call me
- ☐ Please send a sales representative

ADVERTISER

Fax to: _____

Fax No.: _____

Or mail to: _____

BUYER (or paste your business card here)

From: _____

Company Name: _____

Phone No.: _____

Fax No.: _____

Address: _____

Job Title: _____

COMPANY INFORMATION

1. Our business is mainly:

- ☐ Storefront reseller
- ☐ Non-storefront reseller
- ☐ OEM/Integrator/Assembler
- ☐ Other _____

2. We plan to buy this product:

- ☐ Immediately
- ☐ Within 3-6 months
- ☐ Within 6-12 months
- ☐ Within 12-24 months

3. Our main product lines are:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

4. Markets / Distribution channels we sell to:

- | | |
|--|---|
| <input type="checkbox"/> Distributors | <input type="checkbox"/> Small-medium size business |
| <input type="checkbox"/> Dealers | <input type="checkbox"/> Government / School |
| <input type="checkbox"/> VARs | <input type="checkbox"/> Home-office / Consumer |
| <input type="checkbox"/> Manufacturers | <input type="checkbox"/> Other: _____ |

5. My job function can best be described as:

- | | |
|---|--|
| <input type="checkbox"/> President | <input type="checkbox"/> Vice president |
| <input type="checkbox"/> General Manager | <input type="checkbox"/> Store manager |
| <input type="checkbox"/> Purchasing manager | <input type="checkbox"/> Financial manager |
| <input type="checkbox"/> Marketing manager | <input type="checkbox"/> Other: _____ |

Signature: _____ Date: _____

***Now fax the form directly to the advertiser.
You'll have all the information you want, in no time.***

(Continued from page 44)

value products, without any of the bells and whistles like multimedia and CD-ROM, range in price from \$2500 to \$3000.

Durability, toughness and fair price still appeal to the smaller independent company, the SOHO market and students.

Medium mobile sales professionals, who make up the second market, are typically looking for high-powered features like multimedia, CD-ROM technology, motion video architecture, connectivity, and a docking station. Power needs translated into ruggedness and exploit into the realm of gigabytes and have put the Pentium 33 into the midrange of products. All this is available for between \$4000 and \$10,000.

"That's people who want the absolutely leading edge technology," IBM's Peter Sutherland whose Thinkpads have always dominated the expensive end of the market says.

"They need the biggest screens, the fastest processors, the fastest CD-ROMs, latest multimedia and best batteries."

The third market are people who want true portability by carrying a machine which weighs less than their pants. They want lightweight access to information and they'll install external components if they want connectivity, CD-ROM or a docking station.

They are looking for a thin notebook with Pentium architecture to drive their database and spreadsheet. They can get it for around \$4000.

These used to be called the sub-notebook. "By naming it that, it killed the market," Alok Sarna explains. "Anything sub means less. Less is a lot of people means price. In fact sub-notebooks were less in everything except price."

Sub-notebooks have been resurrected. Because of the other new trends, they are now thinner without sacrificing any capabilities. Though they are making a comeback, there are fewer

manufacturers of sub-notebook computers.

"The notebook marketplace serves a lot of people by the type of user it serves," says Impulse's Alok Sarna. "It's people with money. It's people who appreciate technology and put it to good use. So selling a \$5000 or \$6000 notebook is not as daunting as selling a \$3000 or \$5000 desktop."

The stakes are high in the world of mobile computing. With all the advances that have been made it's become very competitive. If you don't succeed you don't survive. That means having to play your whole hand and to excel in all the directions the industry is heading.

"To just have design without having the right processor size, screen size, screen technology and battery technology doesn't cut it any more," Mary Bonnell, marketing manager for the PC business at Digital Equipment of Canada says. "You can't pick one without the others. They all go together." □

PEOPLE

EMFAC appoints new western region branch manager



Canadian territory that this office serves.

Quan brings over ten years of management, sales and marketing experience in the computer distribution industry to EMFAC. He was formerly a Regional Account Manager with Ingram Micro's Consumer Markets Division. Prior to that, Quan was the Director of Marketing at Globeline Canada for 3 years.

Quan's new responsibilities will be to grow sales, build the reseller customer base in the western provinces and enhance operating efficiencies by implementing the Markham head offices' new ISO 9000 systems and procedures.

Supernov pulls down BC New Canadian Entrepreneur Award

Supernov, Vancouver operation, was the 1995 BC New Canadian Entrepreneur Award in the Wholesale Category. It was voted by the industry as the number one distributor of computer products in the country. Supernov earned it by providing their customers with top

products, highly skilled technical support and by their ongoing efforts to understand the needs of the market. Charlton Lutz, General Manager, started the Supernov Vancouver operation in 1989. The company has grown since then. In July, 1995, the company obtained an ISO 9002 Certification. Charlton is one of the founders of the Western Canada Computer Distributors Society. He is the current president of the WCCDS.

Supernov is one of the larger computer product distributors in Canada. The company distributes over 1,500 products to over 7,000 resellers across Canada. It is headquartered in Markham, Ontario. The company is currently setting up its Montreal sales office to serve the Quebec and Eastern markets of Canada.

Last December 17, 1994, Supernov was selected by The Financial Post as one of Canada's 50 Best Managed Private Companies.

Information Access gets new GM

Deborah MacLean-Galloway has been appointed as general manager of Information Access Inc. (IAI) by Andrew J. Aitken, president of IAI. The company is a value-added distributor of desktop and workstation technologies across Canada. MacLean-Galloway will oversee sales and marketing initiatives as well as operations.

MacLean-Galloway has 18 years



experience in the software industry and recently worked with Oracle Canada. She was also at Integrated Software Systems Corp and Honeywell Information Systems.

IAI distributes Office/Biz computer software from AlphaBion, Watermark's Enterprise Imaging Software, Banyan's full line of messaging products and Platinum's premier Force and Team.

Aztch New Media gets new VP

Brian Austin is now VP, North American Sales for Aztch New Media, a CD-ROM publisher. Austin spent 5 years at Leading Edge Computers serving most recently as VP sales.

He reports directly to Allen Best, VP and GM. With placements in several leading computer retailers like Computer City, ComputUSA, Electronic Boutique, MediaPlay Micro-Center and others, Austin's experience and account relationships and understanding of the retail market will help put more of Aztch's products into other retail outlets.

SGI gets director of marketing

Rich Gassenberk has been appointed Director of Marketing of Silicon Graphics Canada Limited in an announcement last Nov. 9, 1995 by Dave Black, president of Silicon Graphics Canada.

Gassenberk previously was with Data General Canada where he helped the operation achieve the highest revenue growth of any international subsidiary of Data General.

Before that he was with HP where he spent 10 years in sales management and marketing.

Whoever said you can't take it with you, never had one of these!

THE POWER TO GO ANYWHERE



At a suggested list price of just \$3,199, the new Bondwell Pro-575 colour notebook is an extraordinary combination of power, portability, and price. In fact, with its full suite of peripheral ports (including keyboard and monitor), and a 200 pin docking station port, the Pro-575 pretty much replaces a desktop!

Local bus video and Sound Blaster compatible audio, combined with stereo speakers and mike-in / audio out jacks make the Pro-575 the ideal road machine. Whether you're bringing a presentation with you, or just can't live without the comfort and speed of a desktop, the Pro-575 is the answer. (Or for a little extra speed, the Pro-699 for a suggested list price of only \$3,999.)

Both feature a standard 33 meg of RAM and a 520MB hard drive, plus a 32-bit local bus designed to optimize Intel's Pentium processor.



From now on, whenever you expand your horizons, or go beyond your expectations, you can take it with you. To find out more about becoming an authorized Bondwell Pro Notebook dealer contact the sales manager at your nearest 3D Micro location.

PRO-575 NOTEBOOK

- Intel® Pentium® MMX processor
- Dual active colour screen (640x480)
- 4MB RAM expandable to 16MB
- 520MB hard drive
- 3.5" 1.44MB floppy drive
- Two PCMCIA slots
- 32-bit local bus I/O controller
- 32-bit local bus video
- 16MB video RAM
- Built on Intel (i486 compatible)
- Stereo speakers
- Mike-in, speaker out jacks
- Advanced power management
- Hi-res touchpad
- 33MHz PDM BIOS
- Built-in trackball & palm rest
- 80 key keyboard w/ numeric
- Peripheral device ports
- Docking station port (200 pin)
- Wireless III pre-installed
- Two year parts & labour warranty

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with Windows 95
pre-installed!**



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204.772.9028

Toronto
Manny Dillion
905.479.8822

Montreal
Richard Routher
514.333.3922

Moncton
Bill Cormier
506.853.8338

Bondwell

Bondwell PCs are built in Canada by 3D Microcomputers, 650 Birchmount Road Unit, Markham, Ontario, L3R 9R1. Tel: 905-479-7611 x 1, 800-467-7411

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SOURCING DIRECTORY

January 1995

Acer America Corp.

3601 W. 14th Pl., San Jose, CA 95131

Telephone: (415) 960-0000

For desktop, laptop and workstation, or for notebook and handheld personal computers are the final products. Acer's America hardware products.

Asstel Canada

9500 Ambler Rd. Ste 2, Mississauga, Ont. L4N 3M4

Can. (905) 663-1166, (905) 663-1167

ACP Marketing Inc.

8128-1227 V. Magill Pl. Richmond B.C. V6V 2G9

Can. (604) 275-2311 Fax: (604) 275-2311

Software: (408) 367-7227

A distributor of computer accessories, disk drives, power lines, hardware mouse pads, printers, screen filters, disk drive cleaners, keyboards and retail software only.

ADAM Peripherals Inc.

365 Broad Rd., Unit 3, Markham, Ont. L3R 9V7

Can. (905) 485-4775 x 400

Fax: (905) 485-2395

Internet: ajp@adampc.com

Approximately 100 different products from desktops are handled through ADAM's warehouse and sales office located in Markham, Ontario.

ADI Systems Inc.

3417 Rempart Ave., San Jose, CA 95131

Can. (416) 444-5600

ADI is marketing new digital monitors, notebooks, CD-ROM drives and 64-bit PCI graphics controllers and 16-bit stereo sound cards.

Advance Integration Research (Canada)

2727 Tera Condo, Unit 200, St. Lawrence Quebec H7T 1H6

Can. (514) 476-6000 Fax: (514) 894-0382

A.I.T. is a membership of high performance manufacturers offering 486 and pentium in various configurations of ISA, EISA, PCI & VL, workstation, network I/O, SCSI & LVD.

Advance Interface Electronic Inc.

87 Kismet Cir., Markham, Ont. L3R 9T2

Can. (905) 479-4492 Fax: (905) 479-4574

A PC manufacturer/distributor of high performance PC, notebook, and laptop and peripheral leading manufacturers.

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article. Experts. Write examples. Vendors. Optimize. Monitor and Monitor speed storage problems.

Advanced B.C. Tel: (604) 235-0441 Fax: (604) 270-1901

Advance Model Computer

27 Kismet Cir., Markham, Ont. L3R 9T2

Tel/Fax: (905) 306-2724

Can. (905) 499-6660 Fax: (905) 499-6661

An International manufacturer of peripheral cards, power supplies and keyboards, and a Canadian distributor of a variety of imported computer parts.

Agfa Division

Agfa Inc. 17 Bedford Ave., Toronto, Ont. M5P 1G3

Can. (416) 365-1111, ext. 4000 Fax: (416) 361-6000

Agfa is a leading worldwide manufacturer of imaging products and systems. Through its Graphics Systems business group, Agfa markets a range of electronic and photographic process imaging systems and supplies its customers in the graphics, printing and publishing industries. Products include a wide range of desktop systems for image capture, processing and publishing applications; digital cameras; and the BluePrint digital printer. Some of Agfa's imaging desktop systems are the e-quester ScanStation, the new ScanStation II and the latest e-quester Xpress II.

Alaris Inc.

47150 Finnet Blvd., Fremont, CA 94538

Tel: (510) 233-5500

Marlin marketing motherboards, video cards, computer systems, monitors and Packard PC286 CPU.

Altice Inc.

254 Apple St., Unit 5-6, Markham, Ont. L3R 9T7

Tel: (905) 317-7227

Altice is marketing ATI video, acceleration cards, and communication products. New MAC International products have been added and are available in a variety of bundles with ATI acceleration hardware.

Anzher

82 Day Drive, Suite 345, Mississauga, Ont. L5B 2B5

Can. (416) 470-8800 Fax: (416) 470-4396

Anzher is a global provider of quality products and services for networking and telecommunications.

AMO Office Automation

480 West 2nd Ave., Vancouver, B.C.

Can. (604) 271-5500 Fax: (604) 274-6600

In an office automation function based in Vancouver, B.C., AMO sets up and trains personnel to manage their own or their company's office automation system. The company has computer training courses for corporations, schools, and individuals.

AMO provides hardware and software solutions from personal computing to corporate and institutional needs through its 15 branches across Canada.

Artisoft Inc.

10 Carleton Court, Unit 500, Toronto, Ont. M5P 6L3

Can. (416) 223-6600 Fax: (416) 223-6600

Artisoft, from Toronto in the west, affordable and reliable, provides solutions for small and growing businesses.

Asio-Link Computer Inc.

404 West Milton St., Unit 17, Richmond Hill, Ont. L4B 1G2

Tel/Fax: (416) 881-8229

Can. (905) 231-7000 Fax: (905) 231-8272

A distributor of computer components and peripherals. Also computerized systems to speed up manufacturing. Business-to-business is its focus. VISA and MasterCard with major corporations in Central Canada and Montreal.

AST Canada Inc.

233 Matheson Blvd., Mississauga, Ont. L5R 9G7

Can. (905) 276-0000 Fax: (905) 276-0000

Distributors, installers, and service staff of high performance desktop, server and notebook computers through distribution and direct dealer access Canada.

AAS Technologies Inc.

2400 Steeles Ave. E., Unit 10, Mississauga, Ont. L4X 1V7

Can. (905) 604-7771 Fax: (905) 604-7772

A Canadian company develops a variety of software in its products, distribution and sales. The team worked to create a number of well-known brand names in the electronics industry. AAS is now focused on the computer industry in its own. TIS is now focused on the computer industry in its own. TIS is now focused on the computer industry in its own.

Branch office: Tel: (905) 563-4000 Fax: (905) 563-4570

Branch office: Tel: (905) 563-4000 Fax: (905) 563-4570

Beauséjour Electronics Entertainment

10 Avenue Central, Scarborough, Ont. M1B 1C5

Can. (416) 291-0200 Fax: (416) 291-0200

Beauséjour is a national distributor of software and hardware products from the small office/home office market.

These products are sold under various educational software manufacturers software. Software products: PCs, printers, modems, speakers, CD-ROM hardware and software.

Branch office: Tel: (416) 433-4000

Birds Marketing

112 East Park Drive, Unit 1, Markham, Ont. L3R 9M5

Can. (905) 477-7771 Fax: (905) 477-7771

Birds is a PC/PS products, cash drawers, customer displays, keyboards, the mouse and electrical printers. For retail and small business in the PC market across Canada.

Branch office:

Branch office: Tel: (416) 291-0200 Fax: (416) 291-0200

Branch office: Tel: (416) 291-0200 Fax: (416) 291-0200

BOCA Research Inc.

577 Remington Pk., Box 136, Toronto, Ont. M6C 1B6

Can. (416) 593-9999

Can. (416) 593-9999 Fax: (416) 593-9999

The company's products enhance the performance and increase the functionality of personal computers. They enable personal computers to be linked through local area networks and share hardware, databases and software.

Brother International Corp.

1 Elm Hill Dr., York, Ontario, Ont. M3J 1K6

Tel/Fax: (416) 351-6666

Can. (416) 351-6666 Fax: (416) 351-6666

A supplier of ink jet and laser printers, fax machines, portable and office copiers, word processors and labeling systems. The company's products are sold nation wide.

BTI Technologies Inc.

3377 Jervis Road, Suite 255, Richmond B.C. V6V 2G3
Tel: (604) 244-6300 Fax: (604) 274-1586
Telex: 1-800-763-4038

A distributor of Multi-System Business System Series Software and an industrial integration, point-of-sale, from mid-value interactive processing and communications.

Sylwide-G&D Solutions Inc.

1610 Highway 64, Abbotsford, B.C. AB3 1A9
Tel: (614) 371-4886 Fax: (614) 371-6044

Sylwide-G&D is a value-added distributor of superior quality storage management, document imaging, fax, business and supply solutions.

Branch office:
Richmond, B.C. Tel: (604) 322-9699 Fax: (604) 322-5346
Toronto, Ont. Tel: (416) 768-0535 Fax: (416) 673-7078

Canadian International Inc.

125 Miller Road, Unit 5 Burnaby, B.C. V4T 2G3
Tel: (604) 732-4720 Fax: (604) 732-4721 1-800-673-0834
Value-added distributor of diskettes, CD-R disks, tape media, speakers, cables, ribbons and accessories including: speakers, sound cards, CD-ROM drives, CD-ROM data guard cases, printer shares, compatible printer ribbons, manufactured HP laser toner cartridges, printers, mice and accessories etc.

Canadian Memory Products Ltd

Suite 250 7677 Stollings Way, Richmond B.C. V6V 2B9
Tel: (604) 279-8781 Fax: (604) 279-8836
Suppliers of high quality memory modules for all types of computers, laser printers, workstations and laptops. The only Win-Group-based Distributor specializing in Memory Upgrade Products. Canadian Memory Products is now serving over 1000 clients.

Carbel Group Enterprises Inc.

136-13011 Mayfield Way, Richmond B.C.
Tel: (604) 279-2768 Fax: (604) 279-2867

A national distributor/wholesaler of accessories for computers and office supplies. Products include power law power control units, keyboard, cable, data wires, printer chargers, DC/AC converter, modular data link, data floppy lock, access, smart holder, copy holder, keyboard, mouse, printer stand, virus test pen, accessories, screen filter, cleaning kit, computer desk, room warmer, cleaner and CD audio/video accessories.

Canyon Canada Inc.

6390 Dene Road, Abbotsford, B.C. V3T 4P7
Tel: (604) 880-3333
Tel: (800) 735-1111 Fax: (604) 735-2844

A vendor of information system products to dealers and distributors across Canada. Products include bubble jet, color bubble jet and laser printers, image scanners, multi-media, PC copiers and color notebook PCs with bubble jet printers.

Cents Technologies Inc.

18 Elm Park Dr., Unit 7, McMillan, Ont. L3E 3G2
Tel: (905) 513-0949 Fax: (905) 513-0648

A national distributor of FPGACore computer core power supplies audio-media and networking products.

CMISYS Canada Inc.

81 Renner Blvd., Markham, ON L3R 9C3
Tel: (905) 472-6708

CMISYS provides software for sales force automation, forecasting, the ActivePlan customer management system. The software integrates database management, word processing, electronic fax, e-mail, mail merge, fax/spacer, order processing, invoicing and inventory into one seamless software package.

Claris Canada, Inc.

3 Clarendon Way, Unit 400, Toronto, ON M5T 1B2
Tel: (905) 547-8071

Claris is showing ClarisWorks 4.8 for Windows, the all-in-one product for business, home and education users that integrates word processing, spreadsheets, database, presentation and drawing functions in one application.

Classic Software Systems Inc.

830 2482 Blenheim Avenue, Deer Creek, Ont. L4T 3K1
Tel: (905) 300-5179 Fax: (905) 429-2543
Tel: (905) 429-5147 Fax: (905) 429-5034

Classic Software Systems Inc. is a national distributor of IBM compatible software, supplying software, hardware and peripherals to dealers, retail to retail.

Computer Plug Accessories

Unit 17 777 Adelaide Rd., North York, Ont. M2N 2B7

Tel: (416) 494-7790 Fax: (416) 494-4744

One of the Canada's largest computer and computer accessories. Retail stores include TechCraft, Run-Data and Linc.

Computer Accessories Plus

1700 Main, Montreal, Quebec, PQ H3G 4G3

Tel: (514) 323-1880 Fax: (514) 323-2222


Computer Accessories Plus is Canada's leading distributor of computer accessories and multimedia products with over 400 different computer & electronic accessories such as micro-floppy drives, photo storage boxes and electronic image processors, etc.

Computer Associates Canada Ltd.

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Desktop-to-mainframe client/server software is available from Computer Associates.



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Comex Micro Systems Inc.

27275 McGill Rd. Suite 106, Richmond B.C. V6V 3C9
Tel: (604) 273-6688 Fax: (604) 274 2814

A manufacturer and distributor of computer systems and peripherals serving all of Canada. Service centers are located in Western Canada.

Branch office:

Calgary AB Tel: (403) 270-1366 Fax: (403) 270-6952

Comronic Computer Centre

80 River Dr, Middlesex ON L8R 5M7
Tel: (705) 479-6366

Comronic Computer is a distributor of brand name and OEM computer systems, peripherals and components. The company specializes in networking hardware and software.

Conner Peripherals

76 Burnhamthorpe Rd., Suite 601, Mississauga, Ont. L5R 9C2
Tel: (905) 273-8221 Fax: (905) 273-8264

Founded in 1986, the company sells, designs and builds a comprehensive line of data storage design solutions products, including disk drive, tape drives, storage management software and disk array storage systems.

Cr-Link Canada

2487 Dundas St. W. Mississauga, ON L5M 1A8
(416) 603-1399 ext. 2

Cr-Link is an ISO 9001 manufacturer of networking and communications solutions providing Ethernet, token ring, FDDI, LAN, Fibernet, Asynet, and voice ATM and ISDN/VLS facilities.

Danvers Electronics Canada Ltd.

170 Alder Rd., Markham, Ont. L3R 4C1
Tel: (905) 413-7290 Fax: (905) 413-7297

A leading manufacturer of computer monitors and video monitor products. Produces high-performance quality monitors ranging from 14 to 21 inches.

Dalve Distribution Inc.

12 11500 Convent Office, Richmond B.C. V6V 3C7

Tel: (604) 294-7032 Fax: (604) 294-7094

A national distributor of motherboards, add-in cards, floppy disk drives, and modems serving Ontario and western Canada.

Branch Office:

Windsor, ON Tel: (416) 499-3893 Fax: (416) 490-6302
Mississauga Tel: (905) 234-8761 Fax: (905) 230-1146

Dynetek Electronics Corp.

3630 Jacobs Road, Unit 171, Richmond B.C. V6V 3Y1
Tel: (604) 270-3653 Fax: (604) 270-3022

A subsidiary of Doreco Corp. Its main business is selling computer monitors, manufactured in South Korea, and VHS hi-fis, VCR, camcorders and system integrators.

DATAMORE Inc.

267 77000 Center Road, Richmond, B.C. V6V 3C7
Tel: (604) 273-2014 Fax: (604) 273-0330

Tel Fax: 1 800 361 0682

Datacomplex is a CD-ROM multimedia distributor of software for PCs and Macs.

Digital Equipment of Canada Ltd.

4150 Irving St. W., Windsor, ON N9P 3C7
Tel: (416) 236-3000

Digital - an internationally Alpha device provides the 68010 RISC performance of Alpha and the strength of Digital VLSI. Its Nova Microbus, Lorbus XE, Multibus, Versa 486 and Frontier designs, and the Proteo Server line are also available. Networking products include DECdata 10/60, GIGAswitch family of TDR and ATM, Rascal/Alpha Multibus microprocessor products, and HubSwitch network reconfigurations and management software. Frontiers include alpha plus Multibus/Alpha 16/60, Multibus internal client design.

Dynatek Automation Systems Inc.

880 Glenview Dr. Bedford, NS B4B 1G8
Tel: (902) 852-3000

Dynatek Automation Systems manufactures and distrib-

utes RAS2 hard disk, tape removable hard disk, tape drive system, and CD-ROM data storage products.

EPROM Computer Systems

240 Goldcrest Blvd., Unit B1, Burnaby, B.C. V5V 3G3
Tel: (604) 292-1306 Fax: (604) 291-4311

Distributor of reprogrammable computer systems and peripherals, also specializing in multimedia CD-ROMs, and CD-ROM CD tapes.

EMJ Data Systems Ltd.

70 Jeter Mill, Oakville ON N3M 6N3
Tel: (519) 837-2444 Fax: (519) 836-1594

A national distributor of computer software, computer related hardware and peripherals.

Branch office:

Edmonton & C. Tel: (403) 276-0104 Fax: (403) 270-7434
Calgary, Alta. Tel: (403) 270-3193 Fax: (403) 274-3753

Regina, S.S. Tel: (306) 818-1621 Fax: (306) 818-9327
St. Laurent, Que. Tel: (514) 743-0560 Fax: (514) 743-0566
Winnipeg, Man. Tel: (204) 948-0077 Fax: (204) 948-0063

EMRAC Computer Corp.

167 Keweenaw, Markham, Ontario, L3R 5T9
Tel: (905) 949-3600 Fax: (905) 949-3604

Emrac is a national distributor and manufacturer of time sharing systems and peripherals. Emrac's head office is located in Markham Ontario with regional offices located in Vancouver and Montreal. Emrac distributes a wide selection of brand-name computer products. Product line includes the complete line of EMRAC and CIPAC Brand Data and GIGABYTE motherboards, Virgeplus and Goldstar monitors, Quartz laser disk drives, American Power Conversion UPS, Seagate hard drives, modems and printers, Panasonic, TASCAM CD-ROMs and Super Discs, Rockwell graphical cards, Emrac computer mice and keyboards products. In addition, Emrac also carries many other brand names.

Branch Office:

Montreal, Quebec Tel: (514) 363-9008 Fax: (514) 363-9112
Richmond, B.C. Tel: (604) 621-4733 Fax: (604) 621-4727

EPSON Canada Ltd.

370 McPherson Ave., Windsor, Ont. N9V 3C7
Tel: (416) 949-5155 Fax: (416) 490-4124

A wholly-owned subsidiary of Epson America, which is a service affiliate of Seiko Epson Corporation, a global manufacturer of computer graphics solutions, LCDs, no-dye and other high-technology innovations. Epson's line of premier products provide complete imaging solutions at the personal and network levels. A national imaging products company specializing in the distribution of dot matrix, laser and ink jet printers, scanners and personal computers and workbooks.

Evelink Computer

4249 126th, Conna Rd., Richmond B.C. V6V 3K7
Tel: (604) 273-4264 Fax: (604) 273-4428

The company manufactures personal computers and distributes PC peripherals.

Branch office:

Calgary, Alta. Tel: (403) 270-4033 Fax: (403) 270-4390

Exide Electronics Canada Inc.

385 Colquhoun Dr., St. Catharines ON L2R 5S9
Tel: (416) 791-0172

The Exide Electronics Powerware Prolog Plus (on 680 to 68080 VLSI) provides network power management with VLSI hardware, specialized software, network connectivity tools and worldwide service and support.

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By Alan Zisman

PC Cards... The Little Cards That Could

slot. (Well, actually, at worst, you've gotta whale about incompatibilities involving twelve topics like IRQ and DMA settings, but we'll leave those for some other article.)

Portables, you see, have no slots. And that limits something between limited and no expandability. If you couldn't plug it into the parallel or serial ports in the back, forget it. Maybe your portable has a long, skinny plug for a docking station or a port replicator, but does anyone actually use one of those? And even if you do—what is good is that when your portable goes out of the office... and that's the whole idea of portables!

Whether it's 8.66 mm by 56 mm and lets you do almost anything you want? If you answered "An American Express Card?" you're probably watching too much TV... but if you answered a PC Card as a portable computer, you're right on the money.

Three Cards Let Laptops Stay Connected—Anywhere

Portable computer users still need desktop power and speed. Members to this cause appear that in the need to stay connected. On the road, in and out of the office, at home? Need a high-speed modem to connect to the Internet, to BBSes, or to access data and email programs on the business network?

And back in the office, would the ability to plug into the network would be a plus?

At the same time, you have to deal with the limited size and weight restrictions of portable computing, where every extra centimeter and gram counts. An added problem is the limited expandability of portables. These three PC Cards (formerly known as PCMCIA Cards) provide an answer to the dilemma, usable by any portable user with an empty Type 2 PC Card slot.

SWK 14.4 Fax Modem

Concord, Ontario's Bantek markets a full range of affordable modems, including a 14.4 PC Card fax-modem. (They also market a separate PC Card Ethernet adapter, for those networking needs). It works well and is available at an attractive price, but it is somewhat hindered by the sparse documentation... a 12 page user-manual.

Portable computers are great—but up until recently, they had a big disadvantage compared to their desk-based counterparts. Desktop PCs are expandable, you see. You want to add a sound card? A network connection? A modem? A CD-ROM? No problem. At worst, you'll have to open the case, and pop an interface card into an unused

slot. Take modems, for example. A modem can be a very useful tool to anyone traveling with a portable computer—even just as far as from the office to home and back. Portable manufacturers used to be very happy to sell built-in modems for their models—over-priced 2400 bps modems, sold to a captive market, that is—with

The P-1114PVI model ships with a proprietary, plug-in phone cable, and a copy of Ontario's 4-to-1 telecommunications software, comprising the version of Comt telecommunications software for DOS and Windows, and Winfax and GOSFax. Of course, it can also be used with the telecommunications and fax software of your choice, after some fiddling with configuration settings.

In addition, a PCMCIA driver disk is included, although the media is required to install Socket/Cord Services are already installed on your portable.

Windows 95 correctly auto-recognizes this card as a "Cbus Light" modem, and will automatically install drivers for it. As with other cards in this review, the SWK model features hot insertion—meaning it can be inserted or removed without having to power the computer down. Because PC Cards can really drain portable batteries, it features a low-power sleep mode, when inserted but not in active use.

The modem performs well, supporting all the standard 14.4-level modem specifications—V32bis, V42bis, and so forth, and operates as a Group II fax, for sending and receiving. It can be configured to work as any of the four standard COM ports, and supports the standard Hayes AT commands. It includes a five year warranty, which can be extended to a lifetime



H A R D W A R E R E V I E W S

each computer model needing a different model modem. But what were the alternatives? Carry a bulky external modem? Buy an equally overpriced mini-modem? Lacking any sort of standards for portable computers, users often simply did without.



PC Cards, expansion enablers for laptops

PCMCIA To The Rescue

Starting in 1992, the Personal Computer Memory Card International Association tried to create a standard...and this, at the same time, a hard-to-remember acronym. At first, the PCMCIA cards were limited to memory cards

one Type I card or a single 3.3 mm Type II card. These are the most common—modems, Ethernet network adapters, SCSI cards, even sound cards can be found in this format. 16.5 mm Type III cards are mostly hard drives. A Type III socket can hold a Type II and a Type I

While the unit includes the Klock for its phone connections, a proprietary adapter is used for the networking side of the card—depending on the adapter, either 10BaseT or 10Base2 cables can be used with this card. (Megahertz's \$249 [MS] Ethernet adapter comes with a similar Klock for 10BaseT plug ins.)

Powerlink 3.0 for Windows software is included, along with *Computers and America-96*. Line connection software, but no general-purpose telecom software is included in the package. 95 users get a token slot at the head—a card to return for free 95 communications and fax software. Running the 95-based initial program adds appropriate drivers for both the modem and networking functions; Windows 95 recognizes the card and installs drivers for all its functions.

This combo card permits simultaneous access of a network, along with 14.4 kba modeming. It also features a built-in Digital Line Guard, an attempt to protect the modem from being plugged into office digital PBX high-voltage phone lines... If you do, you'll be afflicted of potential problems, and the modem will be switched off-line—hopefully before any damage to the modem has occurred. (Digital phone lines are unlikely to harm traditional modems, but the higher voltage has the potential to make any PC-Card modem go up in smoke—beware!)

Another handy feature—Megahertz's software includes a port enable. This can reduce (95) memory

Three Cards Let Laptops Stay Connected—Anywhere

(Continued from page 34)

wisely, with the purchase of GVC's DataGuard communications line protector.

It represents good value in a modest package.

Megahertz 14.4 Kba Ethernet Modem

Two offerings from Megahertz is a step up in features, packaging, and price from GVC's card. It's just one of a series of PC Card modems and networking adapters from Megahertz, now owned by US Robotics.

Unlike GVC's card, which requires a proprietary phone cable (see it at your own risk), the current line Megahertz models feature a trademarked Klock adapter—a thin phone jack that fits into the body of the PC Card when not in use. Simply press on the end, and the Klock pops out. That means you can plug any standard phone jack into this card. Some fear that it may be easy to break off, however, a charge that Megahertz denies. At the same time, use of an Klock and phone cord may make it impossible to use some second PC Cards at the same time.

(as the association's name suggests), and at first, they represented a standard that wasn't, as early models were plagued with incompatibilities. Slowly, the standards have been tightened, and now extend to a wide range of hardware, and to the software needed to allow it to run.

Remained simply PC cards, there are now three standard sizes. Type I cards are the thinnest—up to 3.3 mm thick. Most of these contain memory cards. Type II sockets can hold

card, or up to three Type I cards. Finally, Toshiba has created an even thicker Type IV socket—but this is not yet a widely-supported standard.

Software drivers—so-called Card and Session Services (CASS) need to be loaded, to let your computer know about the existence of your PC cards. Under DOS and Windows 3.x, these drivers require RAM—60 kb or so for each card loaded. While these drivers can be loaded first, drivers cause problems running some programs—

especially if you need to load multiple drivers.

Advanced Operating Systems To The Rescue

OS/2 Warp and Windows 95 don't have the problems. Both operating systems have support for PC cards built in. Windows 95, for example, does away with needing drivers for these cards: CONFIG SYS = AUTOEXEC BAT—installation creates a PC card slot, an icon on

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appear in Control Panel. It's a simple matter to turn on support for PC cards.

And once support is turned on, Win 95 supports hot swapping—adding or removing cards while the computer is up and running. Add a card for the first time, and the computer will take a few seconds to identify it. If it's new, it will inform you that it is loading drivers (you may be asked to insert one of your Win 95 floppies)—then a PC card icon pops up on the Taskbar, and you're in business. Plug and Play like it's supposed to be.

Check each new convention, either really requires at least 4 megs of RAM to run well—and most portables are still being sold with only 4 megs. And just as they can't use standard expansion cards, most portables require special, not power RAM. I wouldn't recommend four megs on any new computer purchase—portable or desktop.

What Can Fit on a Card?

Considering the small size of a PC card (literally about the same size as that Antares

Flash ROM against the cost of the built-in software can be updated as newer versions become available. Megahertz uses the well-regarded AT&T chip set in its modem.

Megahertz is one of the most widely distributed brands of PC Card modems—users who do not need this model's combination of networking and telecommunications should have no trouble finding their 14.4 and 28.8 kba modem-only cards at their favorite retailers.

utilities by setting up the card, and then removing itself from memory. The down side of this is that doing so limits the ability to remove and reinsert the card, or to switch in and out of power-saving sleep mode. Windows 95 users avoid these problems, getting drivers that load into much more available extended memory.

This one includes a full-featured, 170 page manual, complete with all the wondrous jargon that makes this area of computing so much fun. Like the EVC card, it includes a 3 year warranty.

The Install program will set up your machine with its own version of Card and Socket Service drivers. If you do not have any specifically installed. This well-designed program will set up your machine to, by default, connect to a Novell network, and for simultaneous network and modem operation. An Uninstall program can be run to undo the installation.

The documentation aids in the sometimes complicated configuration of the modem for your telecom software—especially necessary when no telecom software is included with this package. It lists a number of different modems that can be chosen if your software lists modems by model, and also includes sample initialization strings for a wide range of popular software. In addition, it gives detailed instructions for wiring with the modem and the (Type 2) fax, and for setting up the network driver with a range of popular networking packages. Additional information on manually configuring the networking and modem functions will appear in the computer do-it-yourselfer.

Jack of Diamonds is a hard card to play...

Like the Megahertz card, the oddly-named Jack of Diamonds TrumpCard, from Geolink, Ontario's Geolink, is also a combo card, combining Ethernet networking and a fax modem into a single, Type B PC Card. Unlike the Megahertz product, this card boasts 28.8 x24 ultra-high speed modeming. It also features cellular support, making it particularly attractive for mobile users. On the other hand, with a \$327 (GST) list, it's also the most expensive card of the trio. (There is a special \$425 (GST) evaluation price in effect, for one unit per customer site, until the end of next March).

Like the Megahertz card, it permits simultaneous network and modem connection. Unlike that card, it does not use (Megahertz's patented) Jack connector—including special cables for both the telephone and networking jacks. A 10BaseT cable is included... on Modem Access Module, allowing both 10BaseT and 10Base2 network connections, can be ordered (adding the price by another \$80).

The included software allows connection to several popular anti-phone models at speeds up to 14.4 (which is pretty good, considering the unreliability of cell connections in general), and includes a nice feature—it senses whether or not the network adapter is in use. If not, it powers down that side of the card, providing dramatic savings on notebook batteries.

The company claims compatibility with DOS, the entire Windows family (including 3.11, 95, and NT), OS/2, and several



HARDWARE REVIEWS

ports to be. And those magic if you've worried with installing cards on standard, desktop PCs, under DOS or Windows.

While Warp doesn't roll in Plug and Play, it also has solid working built-in card services.

You should be aware, however, that while using Warp or Win 95 really makes the use of PC

Express card, but a bit thicker, it's something what can be squeezed into the thin metal case. I don't recommend cutting one open to peek inside, but if you do, you might see RAM chips, digital signal processor, and other standard chips—all neatly soldered onto two sides of a thin board. In fact, everything you need for a standard adapter card—just forced into a smaller case.

This miniaturization inevitably results in somewhat higher prices than for their large equivalents, but as the portable market expands, it's currently 1/4 of the entire market for personal computers and many, the prices of PC Cards is also dropping. A 14.4 kba PC Card modem may cost \$200-250, compared to about



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PC Cards... The Little Cards That Could

(Continued from page 68)

built first for a standard modem, while a faster 28.8 modem may cost \$400-\$450 or a PC Card, compared to \$250-\$400 for its larger cousin.

PC Card modems seem the most common of the main add-ons, with a range of models at both the 14.4 kbit and 28.8 kbit speeds. All have fine capabilities, and all seem to offer fairly similar capabilities—performing virtually

plugged into a standard ISA jack can be manufactured onto a PC Card. Currently, you may buy PC321 adapters from several manufacturers. This allows you to connect a wide range of external SCSI devices, from hard drives to scanners to tape backup to CD-ROM. Or maybe you'd prefer a sound card. Ethernet networking cards come with your choice of 10-base-T or 10-

Base Cards to any desktop computer. With this, you could use a single, short-pocket sized modem on all the machines that you work with.

Currently, the PC Card standard is a 16-bit 6 MHz adapter—sort of like a slow, ISA slot or a desktop PC. A new standard is evolving, however: Called CardBus, it will allow 32-bit operation, at speeds ranging from 30 to 33 MHz. Sort of the local-bus standard for the next generation of PC Cards.

So we can soon expect increasingly find inexpensive PC Cards, as well as more and more devices crammed onto a single card—look to

(Continued from page 68)

emulation of UNIX (though not the popular Linux). As with the other cards in this review, I used it with Windows 95, which again, successfully recognized both the network and modem functions, and automatically installed the appropriate software.

Unlike the Megahertz card, the TrumpCard does not include its own generic PC Card and Socket Services software—I assume, instead, to be compatible with the CSAS software installed with virtually all PC Card systems. Like Megahertz's software, an optional print-emulator allows users to save about 80K of BIOS memory, at the expense of losing hot swapping. QuickLink II Windows fax and telecom software is included. There are separate manuals for installation, and for the modem and networking sides of the card.

GYC 14,400 bps

PCMCIA FaxModem

List price: \$325

Street price: about \$200

Global Marketing, Inc.
20 Barnes Court, Building G
Concord, Ontario L4K 4L4
Tel: 416-738-9340

Megahertz

XJax II 4.4 Ethernet Modem

List price: \$395 (US)

Megahertz
604 North 3600 West
Salt Lake City, UT
84116-0820 USA
Tel: 1-800-891-6342

Jack of Diamonds TrumpCard

List price: \$827

\$425 special limited time
evaluation price

Onyx Communications, Inc.
670 Sandgate Drive
Guelph, Ontario N1G 4S1
Tel: 519-836-8829/1-800-563-2246

While Windows 95 happily recognized the card's modem function, and set it up to work transparently with that environment's native telecom and internet software, it was more difficult to find appropriate initialization string information to work with my older (DOS and Windows) software... eventually I located a Academe file with sample initialization strings— turned several directories deep in the driver disk. Even with this information, I never quite got my software set up to my satisfaction, and found modem performance slower than I would have hoped for a 28.8 kbit modem... perhaps my own fault, but I would have hoped that this vital information would be more clearly communicated.

It's the product of the cards reviewed, but Onyx's offering is clearly the feature-leader at the moment.

COMMUNICATIONS HARDWARE REVIEW

identically to larger models, with the same rated speeds. The biggest difference lies in how to attach the phone jack. Some models, such as Megahertz's X-Jack models, sport an actual phone jack—most in the PC Card's metal shell. Press on the end, and the X-Jack pops out, ready to accept a standard phone cord. This is a convenient arrangement, allowing users to use any phone cord. It can't be lost, but it can break off. Several other models prefer to include special phone cords, which plug into the end of the PC Card—these may be more sturdy, but if you forget or lose the cord, the modem is unusable.

Modems aren't the only way for these versatile cards—almost anything that can be

base-2 connected. Hard drives, up to 170 megabyte have been squeezed into a fat Type III card. There's even a video capture board on a card.

Increasingly popular are multifunction cards. These integrate several cards in one. Combining an Ethernet adapter and a modem onto a single card is an example of this.

Coming Right Up

PC Cards are handy. So handy, in fact, that they may replace those portables to desktop computers. IBM's PC 300 desktop models already include Card slots, and several companies market adapters letting users add PC

the all-in-one modem, network adapter, SCSI card, combined with sound card featuring microphone input and speaker output. Wonder where all those plugs are going to go?

PC Cards have outgrown a somewhat awkward adolescence. They now greatly extend the usefulness of our portable computers, making it much more possible for these tiny machines to almost entirely replace the big, lumbering desktop models. Expect to see them popping up wherever people take their computers—from the office to home, on the road, even on vacation.

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- On Board P3 VGA (256 400K)
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*Conducted by Germany's C3 Magazine (October 1993)
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